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Original Articles

THE OPSONIC INDEX AND THE TUBERCULIN TEST.

THEIR RELATIVE VALUE IN THE DIAGNOSIS AND TREATMENT OF EARLY TUBERCULOSIS IN CHILDREN.*

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With the increasing interest and aroused public sentiment in the question of tuberculosis, the demand for means of making an early diagnosis in this disease grows more urgent. Not only will the physician demand more and more of the pathologist in connection with this subject, but the laymen will expect it from the general practitioner. This will be found to be especially true in the case of children when the anxious mother has the child under close observation and each slight symptom invites attention.

The well-known truth that an early diagnosis in tuberculosis usually means cure is more evident to-day than it ever was. The child, whose vitality is proportionately greater than that of the adult, frequently on receiving an infecting organism into its lungs speedily overcomes the infection, and the pathologic process may become quiescent. Years may intervene before any other symptoms arise, and perhaps not until, as a young adult, he may enter a factory, or sweat shop, or may be exposed to bad hygienic surroundings do we see develop in such an individual symptoms of marked tuberculosis following his debilitating surroundings and from the resistance of the body being brought below par.

The number of children who will be found to show this sequence of early infection, temporary quiescence and later return with pronounced symptoms will not be appreciated until special work is carried out in this line of study.

Among about 40 children recently examined by one of us, and living in families in which tuberculosis had occurred within the past eight years, 25 per cent. were found who showed definite signs of consolidation at one apex. All but one or two of these patients were free from any symptoms and appeared to be perfectly well. If we can recognize in a child the tuberculous infection in the closed stage before tubercle bacilli are thrown out in the sputum, our endeavor to prevent the dissemination of the disease is greatly aided. The adult can be taught to appreciate the importance of cleanliness, but who can control the small boy and prevent him from expectorating promiscuously wherever he goes, to the detriment not only of his own family, but of the whole community?

It is also important not to allow the stamp of tuberculosis to be put on a family when the disease does not exist, but is only simulated by some other disease, such as syphilis, influenza and chronic pneumococcus infection. If a correct differential diagnosis be made in these cases, the hardship of tuberculosis treatment and the isolation of the child are done away with and the parents are relieved from a tremendous anxiety.

The two means which are at present claiming the attention of the medical world for the early diagnosis of tubercular infection are the tuberculin test and the opsonic index. Tuberculin is a powerful agent, and on account of its ability to do harm in inexperienced hands should only be used with the greatest care and by trained observers. Koch's old tuberculin has been used extensively by us both at the infants' and at the children's hospitals. Valuable information has been obtained, and in our hands its proper use has proved to be without danger.

The solution for using this test is prepared as follows: One cubic centimeter of Koch's old tuberculin is added to 999 c.c. of boiled distilled water—one c.c. of this solution equals one milligram. The dose of this solution for an infant or young child is from two to five milligrams, according to the age. In using this test a record of the child's temperature must first be kept every two hours for twenty-four hours. If it is then found that the temperature is irregular or high, the test is not of much value. If, however, the temperature is regular and not over 37.7 C. (100 F.), the test can be used, and has been found in our experience to be of considerable value. After the part of the skin to be injected has been thoroughly washed first with soap and water and then with alcohol and the hands of the operator and the syringe disinfected, the injection is made. If the child is not tuberculous, no symptoms will be noticed, unless occasionally in certain cases of syphilis. If it is tuberculous, the temperature will rise in from eight to twenty-four hours after the injection and will fall again within about twenty-four hours. During the period of reaction there may be a certain amount of malaise, but in our experience there is little or no danger of serious results. A positive reaction will be obtained in about 95 per cent. of cases of tuberculosis. A negative reaction does not positively exclude tuberculosis, although it is very strong evidence against it.

In giving tuberculin to children it is a question whether the best results can be obtained by beginning with a small dose and gradually leading up to the dose which will produce the reaction, or to give a reacting dose at once. It has been held by some observers that the small primary dose produces a certain amount of immunity which interferes with the desired final and

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marked reaction which proves that tuberculosis is present. On the other hand, it is now usually accepted that the small dose repeated with intervals of three days does not cause immunity and gives a less violent reaction. It is to be understood that too large a dose of tuberculin is as dangerous as too large a dose of any drug, notably opium, strychnin, or arsenic, which in proper doses are harmless, while in toxic doses they may be fatal. An instance of this truth is the following, and is noted simply that as in drugs so in the tuberculin test extreme caution should be taken before administration.

A boy 8 years old was seen by a physician, the history being that he had been having some slight lesions of the skin of the legs and arms, represented by small blisters, for three weeks. However, he looked fairly well. He complained of slight epigastric pain. Physical examination was negative, except that a number of small fluctuating and nodular swellings of the legs and arms and an occasional indurated area were detected. The white count was 17,800. Pulse was 120, respirations 30, temperature 100 F. The Roentgen ray showed no involvement of the bones. One of the lesions was incised and smears taken which showed a negative result. The urine was normal. Eleven days later, as he was not improving, 4 milligrams of Koch's solution (by mistake undiluted) were given for the diagnosis of a suspected tuberculosis. Two hours later the boy had a chill, headache and a temperature of 104.8 F. Later there was vomiting and high pulse, which continued during the night. Pulse was 150, respirations 50, temperature 106.5 F. He became cyanotic, collapsed and died the following day at 8:30 a. m. The autopsy showed acute general miliary tuberculosis and tuberculous ulceration of the cecum, but no lesions pointing toward the immediate cause of death.

As a corollary to confirm the tuberculous reaction in this case was the following history:

Another child, a girl about 6 years old, had been sick for some weeks. She had a slight cough, with loss of appetite and weight, and was pale. Physical examination was practically negative, except possibly lessened resonance of the front of the lungs. Temperature ranged from 100 to 101; pulse was 120; respirations 30. The Roentgen ray, however, showed small areas of slight consolidation in both lungs. She was gradually growing worse, and in order to obtain a definite diagnosis she was, at the same time and by the same physician, given the same dose (4 c.c.) of Koch's solution undiluted. In a few hours the temperature was found to be 106 F., the respirations were slightly increased, and the pulse was increased in rapidity, but except that she felt rather sick, she had no other symptoms, and by the next morning the temperature was the same as before the administration of the tuberculin. From this time all the symptoms improved; the signs in the lungs entirely disappeared, the *x*-ray showed no definite signs of pulmonary disease, and in another month she seemed to be perfectly well. A question for future study to decide is whether or not the tuberculin in this latter case was curative.

If the temperature is under 100 F. 1/10 milligram is given as the initial dose. When no reaction is obtained the second dose of 1 milligram should be given three days after the first injection. A third injection after an interval of three days more has frequently been necessary and has been 3, 5 or even 10 milligrams, according to the age of the child.

If an undecisive reaction is obtained with the second injection, the third should be smaller in order not to get a violent result with the larger dose. Two other of our cases were of special interest. These children—respectively 10 and 13 years old—showed signs of consolidation of both apices, with loss of weight, with cough and with expectoration. An examination of the sputa failed to show the tubercle bacillus, but numerous influenza bacilli were present. Three injections of tuberculin were given, the maximum dose being 10 milligrams without a reaction. These cases were undoubtedly cases of chronic influenza with consolidation, and the removal of the fear of tuberculosis was a great blessing to these families.

A positive reaction consists not only of a rise of one or more degrees of temperature above the previous level, but as much importance is to be placed on the constitutional symptoms and signs. When, following the injection of tuberculin, the patient complains in from 24 to 36 hours of headache, feverish sensations and nausea, and there are vomiting and diarrhea, with marked tenderness about the seat of the injection, and especially if there is an appearance of cogwheel or harsh breathing and râles over the suspected area, the result is positive, even without a decided rise of temperature. Some cases will give almost all these symptoms and others very few, but the examination of the chest immediately following a reaction is of great importance.

The opsonic index may be a great aid in diagnosis when, on account of extreme prostration, or a high irregular temperature, tuberculin can not be given. If we follow the index in a case of pulmonary tuberculosis we find it runs in three different ways: low, high and fluctuating. They are important from a diagnostic point of view in the order given. Thus when we find a constant low index it may mean tuberculosis or only a lowered general resistance to the tubercle bacillus. When the index is constantly high we are generally justified in believing that the body is constantly taking up into itself small quantities of tubercular products, which from some focus stimulate it to increased resistance and, therefore, keep the index high. Tuberculosis is practically always present when this occurs.

The fluctuating index is of still greater value in that it indicates overdosage of the system with products from a tuberculous focus, and we, therefore, get a series of positive and negative phases. When the symptoms indicate tuberculosis and the physical signs correspond, we are generally safe in our diagnosis if the index is found to be a fluctuating one.

Of still more importance is the treated serum reaction. This test is made in the same way as the ordinary opsonic index, except that both the normal and pathologic sera are treated for 10 minutes at 60 F. in water before using. If the opsonins in the pathologic serum are concentrated, they are not affected by heating, whereas those in the normal serum are destroyed. Comparison of these will then show practically no phagocytosis in the test with normal serum, as its opsonins have been destroyed, whereas the opsonins in concentrated form in the pathologic serum are unaffected and phagocytosis occurs. This test is very reliable and will clinch a diagnosis when it occurs. Unfortunately, in the earliest cases it can not always be done, as the opsonic content of the serum may not be sufficiently concentrated. The index then may tell us a great deal as to the presence or absence of tuberculosis.

The effect of tuberculin on the index is a variable one, depending on the dosage and the time when it is given. If tuberculin is given in sufficient doses there first occurs a negative, followed by a positive phase of the index. If the dose is a very small one, the negative phase may be so temporary that it will be missed and only the positive appear. When the dose is sufficient to produce a reaction in the patient, there is a marked negative phase and after a number of days the index returns to normal and gradually enters the positive phase to re-

main there several days. The sense of well-being so often seen in patients for a number of days after they are well over the reaction from tuberculin occurs when their resistance is increased and the index above normal.

The opsonic index may also give us some idea of how the patient will stand the increasing doses of tuberculin given for a tuberculin test. If an examination of the index before inoculation proves it to be low, and the initial injection gives a marked negative phase, it is probable that further injections of increased strength will not only give a marked lowering of the index, but the constitutional symptoms of a reaction as well. The general rule in giving vaccine, that when the index is very low the first injection should be small, applies to tuberculin as well as to the vaccine of staphylococcus, pneumococcus and other organisms.

In the treatment, Trudeau believes that minute doses, steadily increasing and extending over several months, should be given, seeking, if possible, to avoid reaction. This will increase the patient's resistance, improve the general condition and aid in healing the process. Wright believes that the dose of tuberculin should be controlled by the index, the object being to keep the index high with continuous small doses of tuberculin. Whether or not this is sufficient in treating tuberculosis is undetermined, as there are many other factors in the production of immunity besides opsonins. We certainly have not found it necessary to follow the opsonic index when we have used the tuberculin therapeutically.

When we have used small increasing doses over a long period of time we have seen numerous cases in which the final results have certainly been favorable. Reactions have been very few, and we are, therefore, encouraged to continue our studies in this direction.

CONCLUSIONS.

The early diagnosis of tuberculosis in children is more important to-day than ever before on account of the increased facilities for a cure and the possibility in this stage of preventing the spread of the disease, and also because a quiescent process may be prevented from becoming an active one.

Tuberculin is a valuable diagnostic agent in early tuberculosis, but when not used properly is dangerous, and in inexperienced hands may bring disaster.

The opsonic index may be of great aid in the early recognition of tuberculosis, especially when tuberculin can not be given on account of temperature or prostration. The use of the opsonic index may give some indication for the control of the dose of tuberculin used for diagnosis as well as for its therapeutic effects.

DISCUSSION.

DR. CHARLES G. KERLEY, New York, said that Dr. Koch's observations at the Babies' Hospital agree practically with Dr. Rotch's statements, particularly that no harm is done by injection and that one injection usually suffices. The usefulness of it has been demonstrated also in case of tuberculous peritonitis, in which diagnosis is often difficult, when there is no sputum to examine. For some time this method has been of signal service to Dr. Kerley; it strikes him as a useful measure in diagnosis.

DR. F. S. CHURCHILL, Chicago, said that the subject is too young for us to draw any general conclusions; not enough cases have been studied. He mentioned a case in which tuberculin was given by Dr. Hamilton—the dose being regulated by opsonic index—in his service at the Presbyterian Hospital. The patient, a boy 11 years of age, who was in the hospital for about six months with tuberculous peritonitis, eventually got well. Of course, patients with tuberculous peritonitis get well without tuberculin. With regard to Dr. Rotch's suggestion that vaccine be used for diagnosis, he is inclined to think fully as much value can be attached to the phenomenon of agglutination with these various organisms. In many instances of meningococcus cerebrospinal meningitis on record the phenomenon of agglutination has been observed.

DR. ISAAC A. ABT, Chicago, said that he wished to throw out a warning not to be too reckless. He has had some sad experiences when repeated doses were given. He mentioned a child of 7 or 8 who had obscure spinal trouble in which tuberculous spondylitis was suspected, and after the first dose of tuberculin no reaction occurred. Repeated inoculations with tuberculin were made, never exceeding 2 mm. In the course of two or three weeks the child developed tuberculous meningitis, and he thinks that every one felt some latent tuberculous focus had been started up.

DR. L. C. AGER, Brooklyn, said that in foreign literature, more particularly the French, there seems to be wide divergence of opinion as to a safe dose. Here in America we ought to determine how much we ought to use. Dr. Rotch speaks of using as much as 10 mm. at a dose. On the other hand, some French authorities only give doses of a fraction of a milligram, and say that anything more than 2 or 3 mm. is unsafe for children. All case reports ought to state definitely the dose and number of repetitions. He asked if Dr. Rotch had confined his experiments to the one preparation.

DR. LOUIS FISCHER, New York, said that he has not used tuberculin much in the last five years. He would be afraid to use it until we have a little more positive knowledge of its real value. The value of the opsonic index, he thinks, is still one that has to be carefully studied. The opsonic index can not be applied in private practice. The men who have used it excessively speak against its use for general purposes. Dr. Fischer stated that he would hesitate to advise tuberculin for therapeutic purposes, and even in those obscure cases in which physical signs are absent, as in a central process of the lungs, he would rather go on record as being one who would wait than to run the risk that he saw one patient take within a few hours after administration of tuberculin. The tuberculin test is like others except the specific antitoxin in diphtheria. He does not think that we have reason to say that any serum is a specific in cerebrospinal meningitis or tuberculosis. There are patients with tuberculosis who do not respond to tuberculin, and at the same time have tuberculosis. Dr. Fischer would rather use ordinary methods of physical examination for the present. Even so small a dose as .1 of a mm. he saw result fatally within a few hours.

DR. A. W. FAIRBANKS, Boston, asserted that in his opinion one reason for the strong sentiment against tuberculin is due, especially as it emanates from Berlin, to Virchow and his pupils, and especially to Langerhans. Dr. Fairbanks said that he can remember Langerhans pointing out case after case that had come to autopsy with miliary tuberculosis, and telling the students that the disease had been disseminated by the tuberculin. It is well known, he said, that Virchow and his pupils, and particularly Langerhans, were prejudiced; the reason for this undoubtedly lies in the fact that soon after the discovery of antitoxin, Langerhans' son was taken with diphtheria. The antitoxin was injected—presumably late. The child died. Ever since then—or at least, Dr. Fairbanks said, up to 1898—Langerhans has been bitterly opposed to the use of any serum. His teaching, and that of some of Virchow's pupils, has been a factor in prejudicing medical men. It has taken Dr. Fairbanks nearly nine years to overcome his reluctance to its use, and in a large clinic of tuberculous patients he has opposed its use until within the last year.

DR. S. J. WALKER, Chicago, asked Dr. Rotch whether, in his experience, the inoculation has been beneficial in the treatment of tuberculous adenitis. Dr. Walker has had experience with two cases of tuberculous adenitis, and so far as the diagnosis was concerned, the opsonic index gave no clue. It was practically normal and did not vary above or below. In one case the treatment was continued over a length of time without any benefit. He has been unable to find anything in the literature regarding the therapeutic value of tuberculin in tuberculous adenitis.

Dr. R. S. Rowland, Detroit, Mich., has been doing a limited amount of work with the Wright theory, but it is too early, he said, to draw any conclusions. Several interesting facts were brought out by some of the other workers in Detroit. One patient with tuberculous peritonitis, too bad for operation, was given tuberculin as a last resort and improved rapidly. The appetite improved first, then the general condition, and the fluid disappeared from the abdomen. The condition was so good that operation was delayed, and now it is not thought necessary to operate. Dr. Rowland saw a postoperative case beginning to show improvement, but whether or not this was due to the opsonic treatment or to the time in the disease, he is unable to say. However, the opsonic index has been higher than it was before this treatment, and the patient's condition is much better. Two facts have been brought out by this treatment. One that may be of value in the future, and which he thinks worthy of consideration, is the fact that in tuberculous peritonitis if the index is low before treatment, it can be raised so as to have the patient in better condition for operation. He thinks that operation is indicated as well as the opsonic treatment in most cases. After operation the opsonic index goes down and remains low for a long time, and this shows possibly that operation may be simply an autogenous method of producing vaccine. It may be that this is the reason why operation is of value. Dr. Rowland's observations lead him to believe in smaller doses of vaccine for therapeutic purposes than Dr. Rotch has given, from 1/3,000 to 1/4,000 mg. of tuberculin (T. R.) is a sufficient initial dose. This is gradually worked up as the patient can stand it. He also mentioned a case of meningitis—diplococcus meningitis. He saw the case late and after securing the vaccine the child had improved to such an extent that he was not allowed by the parents to use it. If he had given the vaccine he would probably have thought the improvement due to it.

Dr. T. M. Rotch, Boston, said that he has been using entirely Koch's original preparation. So far as he knows there is no great difference in the efficacy of the two preparations, only care must be exercised if using a new preparation to give much smaller doses. In these cases he investigated he gave the tuberculin without diluting. Those two children had enough to kill cows. As to the danger, he said that besides what has been done at the Children's and Infant's Hospital and at the Massachusetts General Hospital, a large number of children are being treated every day in this way. It is routine treatment to discover early tuberculosis. The work is done efficiently by Dr. Floyd of Boston. Dr. Rotch said that if tuberculin is given properly, there is no more danger than in giving opium, strychnin or arsenic. The dose for children is from 2 to 5 mm. He has never given 10 mm. That amount has been given at the Massachusetts General Hospital, but he thinks that from 2 to 5 mm. is the best dose. One milligram very seldom gives reaction. If one wishes to get a slight reaction, the interrupted treatment, one can begin in that way, but if a reaction is desired in one dose more should be given. Dr. Rotch can see no reason for not using this measure in private practice. It is taking a shorter time to determine the disease. Ordinarily he has an exceedingly intelligent class of people to deal with, and they are glad to know, because if it is beginning tuberculosis there is opportunity for cure. From 2 to 5 mm. is given as a diagnostic dose. For therapeutic measures he starts with small doses, going over a period of weeks and months. In adenitis they have had favorable results at the Massachusetts General Hospital. In the wards there were 25 cases of cerebrospinal meningitis in which he used antitoxin. It looked as though it might cure these patients at first. The final conclusions, however, were that it probably was not curative, but they have been using diphtheria antitoxin with the meningococcus vaccine, and this will carry up the opsonic index. Then they stop the antitoxin and go on with the vaccine. In the last ten or twelve years children that come into the Children's Hospital, no matter what appears to be the trouble, are given diphtheria antitoxin. This has given opportunity of comparison with other vaccines. Dr. Rotch has just reported a series of cases of cerebrospinal meningitis. He thinks that it is doubtful indeed whether or not the vaccine treatment is going to be any more curative than antitoxin, but it is worth trying. A case which was brilliant, but which he does not think proves anything, was that of a child 5 years old in private practice attacked within twenty-four hours; there was high temperature and the child could not swallow. Dr. Rotch gave it a dose of 50,000,000 organism; the next day it recognized its mother, ate and swallowed, and in two weeks it was sitting up; not cured, but with subacute symptoms of contractures. He said that he should not have stopped there, but should have known when to give another dose. This physicians have yet to learn.

THE DIAGNOSIS OF ANEMIA.*

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We may be concerned either with the fact, or with the type. Is anemia present? If so, what kind?

The question whether or not anemia is present can be decided only and sufficiently by testing the hemoglobin. We should never assume that anemia is present either from the symptoms alone, or from the appearance of the patient, or from both taken together. Mistakes from this cause are many. On the other hand, there can be no mistake in supposing that the patient who has a low hemoglobin is anemic, and practically no mistake in supposing that the patient whose hemoglobin is normal, or nearly so, is not anemic.

Diagnoses of anemia are very much more frequent than the facts justify. Patients are frequently treated for anemia when nothing more than a pale skin substantiates the diagnosis. The treatment does no harm except in so far as it may prevent us from taking measures more appropriate for whatever disease does genuinely exist. On the other hand, the mistake of assuming that a patient is not anemic, because there is a good color in the face, may lead to more serious consequences.

When the hemoglobin is normal, then, we need go no further in our blood examination, and may rest satisfied that anemia is not present. If the hemoglobin is low, we must endeavor, both by a general physical examination and by a study of the blood, to determine what type of anemia is present.

The important types of anemia may be classified as follows:

1. Chlorosis.
2. Pernicious anemia.
3. Secondary anemia, including:
   (a) Parasitic types.
   (b) Other types.

Rarer varieties are:

4. Myelophthisic anemia.
5. Aplastic anemia.

The first two types mentioned above are distinguished from the others by the fact that we have no idea of their cause. In this sense they may be and have been called "primary." The other types of anemia are "secondary" in the sense that they would not exist but for the presence of other diseases of one or another organ.

In the practical work of distinguishing these types of anemia the history of the case is of value to us chiefly when it points to some disease to which we can attribute the anemia as a result. If there is a history of recent malaria, dysentery or hemorrhage, this is important, though not conclusive, evidence that the anemia be-

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longs to the type called secondary. If the history gives presumptive evidence of the presence of malignant disease, of nephritis, or syphilis, it may afford us a useful hint regarding the type of anemia present. But so far as the symptoms of anemia itself are concerned, they are quite indistinctive and almost useless to us in differential diagnosis, because they do not differ essentially from those which may be produced by cardiac disease (organic or functional), or by a variety of debilitated states. The pallor and weakness, the dyspnea, the stomach troubles, the slight edema of the ankles, the throbbing arteries and disturbed sleep are all non-characteristic of the anemia to which they are due, because perfectly similar symptoms may be produced by other diseases.

On the other hand, considerable aid is given us by taking account of the age and sex of the patient and by taking a good look at him. Thus anemia existing in a girl between 17 and 25 is generally of the type known as chlorosis, while severe anemias in persons past 45, who do not complain of any special local symptoms but chiefly of general weakness, are very apt to turn out pernicious.

It is, therefore, on the physical examination of the body generally, and the blood in particular, that we must depend for definite diagnosis. To this subject I now turn.

The most important differential point in the physical examination of cases found to be anemic is the determination of the presence or absence of some organic disease known to be capable of producing anemia. On the other hand, a negative physical examination, including a negative examination of the urine, is a most important piece of information. Provided we know that anemia is present, a negative physical examination in a young girl points strongly to chlorosis, and in a person past 40 points strongly to pernicious anemia. I do not think there is any type of anemia which can be positively determined by the blood examination alone. Consequently, in the description of the different types to which I now turn, I shall group together all symptoms, physical signs and hematological data, which together determine diagnosis.

I. CHLOROSIS.

There is no such thing as chlorosis in boys, and if it occurs in a woman past 30 it is almost invariably a relapse or recurrence of a chlorosis established earlier. The typical age, as has already been stated, is from 17 to 25, that is, during the years immediately succeeding those in which the function of menstruation is established. Though the patients complain of weakness, dyspnea and the other symptoms common to all anemias, they are usually not emaciated, but rather plump. Physical examination is negative or shows nothing more than systolic murmurs at all the valvular orifices of the heart, with perhaps slight edema of the ankles. The menses are often suppressed, and dyspepsia in one or another type is almost always present. The blood shows a reduction of hemoglobin to a point which averages 40 per cent. of the normal, while the red cells are not far from the normal point, averaging about 4,000,000 to the cubic millimeter. This discrepancy between the reduction of red cells and the reduction in hemoglobin means that each cell contains only about half the amount of hemoglobin present in a normal red cell. This fact is technically known as a "low-color index," and is further revealed in the stained film by the striking pallor of the centers of the corpuscles and the general tendency to a diminution in the diameter of the cells. There is nothing remarkable about the white cells. The disease seems to be getting rare—rarer than pernicious anemia.

II. PERNICIOUS ANEMIA.

The onset of this variety is strikingly insidious. Patients can rarely tell within a year or two when it was they began to feel the general weakness and incapacity for the relief of which they seek advice. There are usually no striking local symptoms, and physical examination in the early stages of the disease may be absolutely negative. It is only relatively late that we see the pale yellow tint of the skin, or find any changes in the function of the spinal cord. Patients are usually well nourished, for their digestive functions are rarely disturbed except for relatively short periods of time. The red cells are usually reduced to 2,000,000 or less at the time the patient first consults a physician. This reduction is in striking contrast to the absence of severe pain or other local symptoms. The hemoglobin is usually reduced relatively less than the number of corpuscles, that is, with a count of 2,000,000 red cells we may have 50 per cent. of hemoglobin. The white cells are usually subnormal. In the stained specimen we see that each cell contains as much hemoglobin as it ought. There is no pallor of the centers and the cells are strikingly oversized. This is the most important single point in the diagnosis of the disease. Less important are the great deformities, the changes in staining reaction, or the presence of nucleated red corpuscles.

This blood picture is not absolutely characteristic of the disease, but, when taken in connection with the history and the physical examination as above outlined, it is almost pathognomonic.

The diseases most likely to be confused with pernicious anemia are cancer of the stomach, myxedema, nephritis, cardiac disease and one or another of the parasitic anemias. Each of these will now be discussed, as types of secondary anemia.

III. SECONDARY ANEMIA.

1. *Malignant Disease and Pernicious Anemia.*—In the vast majority of cases malignant disease produces no anemia that is at all likely to be mistaken for pernicious anemia, but now and then we see cases, especially of gastric cancer, in which the count of red corpuscles will not distinguish the two diseases. Here the presence of marked and especially of continuous digestive troubles, together with a considerable degree of emaciation, a low-color index, and the presence of small-sized, poorly-stained red cells, with relatively few megaloblasts, or none at all, points to cancer of the stomach. Of course where a tumor can be felt the difficulty of diagnosis is not likely to arise. If, on the other hand, the patient is relatively well nourished, has periods of weeks or months during which digestion is good, and if the blood shows a high-color index and large-sized red cells—greatly deformed, abnormally stained and often nucleated—the disease is probably pernicious anemia.

2. *Myxedema.*—A clinical history and picture identical with that of pernicious anemia may be found in myxedema, except as regards to the data afforded by blood examination. The age of the patient, the insidious onset, the good nutrition, the general symptoms of anemia, the digestive disturbances (occasional, not continuous), may be the same in both diseases. But here the blood examination sets us right, for the blood of myxedema is never strikingly similar to that of per-

nicious anemia, but presents the characteristics of other types of secondary anemia, as described in the last paragraph.

3. *Nephritis.*—Only the external aspect of the patient and the general complaints are confusing here. The blood is quite unlike that of pernicious anemia, and the examination of the urine should help us to a speedy differentiation of the two diseases. It should be remembered, however, that pernicious anemia can and often does coexist with a considerable degree of those senile changes in the kidney which receive the name of interstitial nephritis when they become extreme. This coexistence of the two diseases should not be interpreted as anything more than coincidence. The nephritis is in no sense the cause of the anemia, for in the vast majority of cases this type of nephritis runs its course without any anemia whatever.

4. *Cardiac Disease.*—This malady is similar to pernicious anemia only in the symptoms which it presents, and sometimes in the pallor which accompanies it—a pallor due presumably to the imperfect filling of the subcutaneous blood vessels. The absence of any considerable anemia easily distinguishes the two diseases as soon as the hemoglobin test is made.

5. *Myelitis*—Diffuse or patchy sclerosis of the spinal cord accompanies a large proportion of all cases of pernicious anemia. In some of these cases the cord symptoms are so prominent and the symptoms of anemia so mild that the diagnosis of myelitis is made—the anemia being altogether overlooked. The blood examination, however, is usually as characteristic as in the cases without cord symptoms, and if we do not forget altogether to examine the blood the diagnosis is easy. The importance of differentiating simple myelitis from pernicious anemia with cord changes lies in the fact that the latter usually runs a much shorter course than the former.

6. *Parasitic Anemias.*—The fish tapeworm (*Dibothriocephalus latus*) is often carried by an individual without any anemia resulting. In other cases the blood is more or less diseased, and in a considerable group the blood may be absolutely identical with that of pernicious anemia, as has been shown by the minute and careful studies of Schaumann among the Finnish fishermen.

Hookworm disease, on the other hand, while often producing a very severe type of anemia, rarely produces a blood picture similar in all respects to that of pernicious anemia, for in hookworm disease, even when the red corpuscles are reduced to 1,000,000 or less, the color index usually remains low, the corpuscles small or of normal size, palely stained and less deformed than in pernicious anemia. Abnormal staining reactions and the larger types of nucleated red cells are less frequent, while the increase of white cells, and especially of eosinophiles, is usually distinctive.

In both the parasitic anemias just described, however, an examination of the feces is the mainstay of diagnosis, for in cases severe enough to produce a profound anemia the eggs of the parasites responsible for the disease are sure to be easily found.

IV. MYELOPHTHISIC ANEMIA.

As a result of a leukemic overgrowth of white cells in the bone marrow, as in the latter stages of leukemia, the red-cell-forming tissue of the marrow is apt to become so much compressed that a pressure atrophy occurs. As a natural result of this the supply of red corpuscles sent out into the blood stream becomes progressively diminished, and a grave anemia develops. This happens in almost every case of leukemia, both of the so-called lymphatic and the so-called myelogenous type, provided the patient lives long enough for the development of the pressure atrophy above described. In conditions other than leukemia, myelophthisis anemia is not often seen, but a few cases have been recorded resulting from malignant disease affecting the bone marrow.

The diagnosis of this type of anemia must depend wholly on its cause, that is, on the recognition of an overgrowth of cells of one or another variety, which drive the red-cell-forming tissue into a corner. This means in most cases the recognition of the disease leukemia, one of the easiest of all diseases to recognize.

In practical diagnosis, therefore, this type of anemia raises no considerable difficulty; it is here introduced merely because from the point of view of pathogenesis it deserves to be distinguished from the other varieties above described.

V. APLASTIC ANEMIA

Most of the recorded cases of this rare disease have occurred in young girls and have been accompanied by severe purpura. The blood is like that of pernicious anemia, except that the erythrocytes are smaller and rarely contain nuclei, while all the granular varieties of leucocytes are greatly diminished. Postmortem we find fatty marrow in the long bones, with no trace of regenerative effort.

ELEMENTS OF DIAGNOSIS IN ANEMIA.

	Chlorosis.	Pernicious Anemia.	Secondary Anemia in General.	Parasitic (Secondary) Anemia.	
				Due to a Fish Tapeworm.	Due to a Hookworm.
Cause	0	0	+	+	+
History	Not helpful.	Not helpful.	Very helpful.	Helpful.....	Helpful.
General physical examination.	Not helpful.	Not helpful.	Very helpful.	Eggs in stools.	Eggs in stools.
Blood	Small cell type.	Large cell type.	Small cell type.	Large cell type (sometimes).	Small cell type (usually).

SUMMARY AND CONCLUSIONS.

1. In the diagnosis of anemia it is essential to take account of all the facts in the case. The etiologic factors and the data of general physical diagnosis are as important as the hematologic findings. Especially is this true in the types of anemia known as secondary.

2. There are but two important types of anemia, if we are to distinguish by blood examination alone. To the first type (the small cell type) belongs the anemias secondary to hemorrhage, malaria, nephritis and other diseases which lead to increased destruction of red corpuscles. So far as the blood picture is concerned, chlorosis is identical with the types just mentioned. It is distinguished wholly by the absence of etiologic factors and by the age and sex of the patient.

3. Pernicious anemia usually, but not invariably, can be recognized by the blood picture alone. If the data of blood examination are combined with those obtained by a careful history and physical examination the diagnosis is one of the clearest and surest in medicine. The most important single fact in the blood examination is the great reduction in red corpuscles, with a relative increase in the amount of hemoglobin per corpuscle (large cell type of anemia).

4. The parasitic anemias are not always to be recognized by blood examination, but present no difficulties of diagnosis if the eggs of the responsible parasites are sought. Myelophthisic anemia is easily recognized by the evidences of its cause and offers no difficulties in diagnosis.

THE TREATMENT OF ANEMIA.*

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I do not intend to read a paper on the details of the treatment of anemia. All are familiar with the chief measures and remedies employed in this treatment: Iron, arsenic, rest, nutrition, fresh air and other dietary and hygienic measures. As to the particulars, any of the many good text-books will give the desired information. But to do some justice to the task assigned to me, which at a weak moment I have thoughtlessly accepted, I shall discuss briefly some points in the treatment of anemia which, to my mind, mark a distinct progress. I do this with special pleasure, since the underlying work of some of these points was done in this country by men to whom the medical profession of this country owes a debt of gratitude for their continued splendid activities in the fields of science and practice of medicine.

The first point I wish to bring out refers to the progress made in the method of transfusion. In secondary anemias, especially in those following acute or chronic hemorrhages, the best measure of treatment of the anemia would be to replace the lost blood. But a century of attempts to carry out blood transfusion proved futile. Alien blood, or defibrinate blood of the same species, is harmful to the recipient, and the method introduced by Von Ziemssen, namely, the rapid withdrawal of blood by a syringe from the vein of a spender and its immediate injection, without defibrination, into the vein of the receiver, had very little success in practice. The method generally in vogue at present is, as you know, the venous infusion of one form or another of a so-called physiologic salt solution. Obviously these solutions do not replace the essential element of the blood, the red cells.

Within this year, however, the problem of transfusion has been brought nearer its solution by a bound, through the experimental and clinical efforts of George W. Crile. Using the improved technic of Carrel, he established an end to end union between a vein of a donor and an artery or a vein of a receiving animal, thus establishing a transfusion in which the blood of one animal is flowing directly into the vessels of another animal free from the dangers of intermediary manipulations. In a long series of experiments, that surgeon-physiologist has studied the effect of such a direct transfusion on the receiving animal and obtained most gratifying results. Even after complete exsanguination of an animal, with complete stoppage of respiration and with only a barely perceptible auricular heartbeat, a direct transfusion led invariably to a complete recovery of that animal. Crile next tested that method in a desperate post hemorrhagic case of anemia in a human being, brothers lent themselves as spenders, and obtained the same blissful result. In a recent communication before the Society for Experimental Biology and Medicine, Crile summarized his present clinical results by stating that the direct transfusion is a positive cure in all acute hemorrhagic anemias, and that in pathologic hemorrhages not only is the anemic condition invariably benefited but also the hemorrhages themselves are, in most instances, controlled without special treatment.

Permit me to point out that the experiments which that admirable man of Cleveland has carried out on seventy dogs will, undoubtedly, save thousands of human lives, and I feel called on to add that the so-called humane societies, which direct their agitation against animal experimentation and which just now, in their libelous circulars, are dragging the good name of Crile into mire, are engaged in a criminal activity which moral men, and especially physicians, should strongly resent.

The second point I wish to bring out concerns a simple method of treatment of pernicious anemia based on an advance made in the understanding of its etiology. The pathology of this disease, which is also designated as primary or idiopathic anemia, is admittedly obscure, but it was generally assumed that the cause is probably within the blood itself. During the past few years several writers have advanced the view that the disease is caused by an infection or an intoxication from the gastro-intestinal canal. These surmises had not much significance, since no facts were available showing a connection between the anemia and some definite form of infection or intoxication. Recently, however, in a profound and extensive study of the chemistry of the feces and the urine and of the bacteriology of the feces of fifteen cases of pernicious anemia, Christian A. Herter made a discovery that within the intestinal tract of such patients certain specific putrefactions are going on which are caused by the activity of anaërobic bacteria and that the *Bacillus capsulatus aerogenes*, discovered by Welch, is greatly in evidence in the feces of these patients. With the recovery of the patients from their anemic condition the predominance of this anaërobic bacillus in the feces disappears. Here we have a definite, well-established fact that at least in a certain number of cases of pernicious anemia, the anemic symptoms run parallel to the presence of well-defined anaërobic bacteria in the intestinal tract, and are probably caused by them. Among other measures of treatment in these cases, Herter recommends frequent and thorough irrigation of the colon, since it is the chief thriving place of these bacteria. Following this suggestion, Dittmar and Hollis were able to report a few months ago cures in two cases of pernicious anemia by irrigation of the colon which resisted all other methods of treatment. A few years ago Grawitz reported several cures of pernicious anemia treated by lavage, irrigation, restricted proteid diet of animal origin and other merely dietetic measures. It may be that lavage, as well as the restriction of the proteid diet, are unessential to the success. At any rate, the discovery that a good many cases of pernicious anemia are due to intestinal putrefaction, caused by anaërobic bacteria, and that some of these patients can be cured simply by efficient irrigation of the colon, present surely a valuable scientific and practical progress.

The third point I wish to touch on very briefly relates to the rôle of iron in the animal organism and its use in the treatment of anemia.

It is an old, well established clinical observation that inorganic iron is a most efficient remedy in chlorosis. For the last two or three decades, however, its use was

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

opposed to and ridiculed by able physiologic chemists and pharmacologists on the ground that inorganic iron can not be assimilated or even absorbed. The history of the scientific struggle over this subject is very interesting and instructive, but I could not think of entering on it in the brief time allotted to me. I shall only say that, as I believe, the struggle is now decided in favor of the clinical position and that recent pharmacologic writers, at least the majority of them, fully admit that ingested inorganic iron is just as capable of being absorbed and assimilated as the organic iron compounds of the food.

In connection with the last-mentioned problem,* I wish to state briefly my view of the relations of the ingested iron to the iron of the hemoglobin, a view which is based on well established clinical and experimental facts, as we know them at present.

The normal animal body commands a large reserve fund of iron which is far in excess over its immediate requirement. The liver, bone marrow, and especially the spleen, are the main depositories for the reserve iron, where it is preserved in the form of resistant organic compounds, like *ferratin*, for instance. All ingested and absorbed iron, no matter of what character and origin, goes first to one of these depots, where it becomes converted into the organic compounds; The first function of the absorbed iron is, therefore, to increase the iron reserve. The iron requirements of the blood are supplied from the organic compounds of the iron reserve, which becomes then converted into hemoglobin; the ingested iron, no matter of what character, is never utilized directly for the construction of hemoglobin. In normal conditions the iron requirement of the blood is small and presents a comparatively constant quantity, which varies but little with the size of the reserve fund of iron, provided the latter does not sink below a certain limit. The quantity of the reserve iron, on the other hand, is apparently capable of greater variation, but also only within certain limits. The greater ingestion of iron has therefore, in the normal animal, no influence on the conditions of the hemoglobin in the blood, as at best it swells only the iron reserve.

From the point of view presented here the metabolism of iron has certain features in common with the metabolism of carbohydrates. No matter in what form the carbohydrates are ingested, they are always deposited in the liver in the form of glycogen, where it exists in excess over the immediate requirements of the body, and from where the blood is being continually provided, after the conversion of the glycogen into sugar, with an amount just sufficient to keep up a certain constant quantity. Iron then, like the carbohydrates, is stored up in the body in the form of intermediary organic compounds into which all ingested materials are converted and all requirements of the body are drawn on.

In conclusion, I may perhaps be permitted to point out that iron is an indispensable constituent of the animal body and, in conformity with the law governing all other bodily constituents, it is provided in considerable excess over the normal requirements of the organism; in other words, they are provided with factors of safety.

DISCUSSION

ON PAPERS OF DRS BUNTING,* ASHFORD AND KING,* CABOT AND MELTZER.

DR. THEODORE POTTER, Indianapolis, said that he has noted the frequency of pernicious anemia in the rural districts. During the last year, for instance, out of five successive patients with pernicious anemia seen in a period of nine weeks, four came from the country. To be sure, the location may have something to do with it. Indianapolis, with its population of nearly 200,000, surrounded by a thriving farming community, has brought to it a good deal of consultation practice from that part of the country. Four out of these five patients came from the country, all men, between the ages of 47 and 55, all farmers. While that proportion is not always the rule, Potter has, for some time, been impressed with the rural prevalence of pernicious anemia. In the medical society it is a common thing to hear reported cases of chlorosis, factory and shop girl's anemia, leukemia, Hodgkin's disease and pernicious anemia, but it is noted that many of the cases of pernicious anemia come from the rural districts.

DR. A. D. ATKINSON, Baltimore, said that he had had a patient with uncinariasis who apparently recovered perfectly. The patient died of pulmonary tuberculosis, four years after treatment for hook-worm disease with thymol, and the autopsy showed no lesion in the intestinal tract.

DR. AUGUSTUS A. ESHNER, Philadelphia, declared that the papers read on this subject have done much to sweep away the attempted differentiation between primary and secondary forms of anemia, especially Dr. Cabot's classification. Dr. Cabot makes three tabulations of anemia, but he points out that the blood changes in chlorosis are practically the same as those in other forms of so-called secondary anemias. The distinction between so-called primary and secondary forms of anemia must disappear with constantly increasing knowledge. While some forms are due to obvious causes, others are of more obscure origin. Thus we recognize parasitic and other forms of anemia, but the causes of chlorosis and of pernicious anemia are at present beyond our scrutiny. As pointed out by Dr. Bunting, however, there is a reasonable probability, in a considerable group of cases at least, that the cause is a toxic one. In view of that fact, and especially in view of the blood findings, it seems that it would be wiser to make a classification based on the blood findings rather than on the etiology. Dr. Eshner proposed, accordingly, a division of anemias into qualitative and quantitative. The designation qualitative may be applied to the type of pernicious anemia, in which there is a change in the relation between the number of blood cells and the percentage of hemolglobin, causing a low blood index, while the designation quantitative is applicable when there is a depreciation in both the hemoglobin percentage and the number of blood cells. A given specimen of blood may, of course, exhibit both quantitative and qualitative changes.

DR. WOODS HUTCHINSON, New York City, said that the more time spent in the study of cases of chlorosis, and the more careful examinations made from every point of view, the fewer cases will be found. He believes that we have been confusing other things with chlorosis, especially incipient tuberculosis. The more the anemias are studied the more will it be found that toxins of some sort played a part in their causation. The motto of a celebrated detective when assigned to a case was *"Cherchez la femme,"* "Look for the woman." In the anemias, our motto should be "Look for the toxin," whether of endogenous or exogenous origin. We may have intoxications set up by bacteria kept as household pets in our own intestines, or we may have toxins which develop from the waste of our own tissues under certain conditions. While the anemias are now divided into primary and secondary, he believes the time will come when primary forms will be abolished and all recognized as secondary. Since Dr. Herter's recent paper, he believes that bacteriologists are now on the track of the particular organism causing pernicious anemia.

In regard to the use of iron he believes that large doses in chlorosis often very considerably improve the condition of the blood, but he deplores the indiscriminate use of iron. It was thus reasoned out in the earlier days: There is hemoglobin in the blood; hemoglobin contains iron; therefore, if the blood is low in color, give iron. But the flaw here is, that although hemoglobin contains iron, it can be split into two moieties, one containing all the pigment, the other none, and the latter contains all the iron. Giving iron will not make pigment.

*The paper of Dr. Bunting and that of Drs. Ashford and King were published in THE JOURNAL August 10.

Another point refers to the dose of iron and the way to give it. The total amount of iron in the body is about 45 grains, and we frequently give 20 or 25 grains a day in Blaud's pill, while the actual amount of iron that can be absorbed is only three-quarters of a grain a day. Moreover, more iron than the body actually needs for its maintenance is contained in the ordinary articles of diet unless these be unduly restricted. The trouble lies in a faulty absorption of iron if anywhere. Dr. Hutchinson believes that if we would study our own cases from the point of the toxins and consider the iron administered as having an effect on intestinal sepsis and putrefaction, we would get better results.

DR. JAMES K. KING, Watkins, N. Y., said that in a few of his cases the blood pressure was very low; in one case it was as low as 40. This was very unusual. He recently saw a woman, 52 years old, in whom had been made the diagnosis of pernicious anemia, according to the most exhaustive examinations. The blood picture of pernicious anemia seemed positive. Every therapeutic measure, including hydrotherapy, vibration, massage, electricity, the various forms of iron, tonics, the red iodid of mercury internally, and hypodermics of the salicylate of mercury had been tried without effect. Colon irrigations were also used faithfully with Kemp's tube for cleansing the bowels, relieving toxemia, aiding in the absorption of food, and stimulating the circulation. No improvement resulted from these various measures. It seemed as though nothing more could be done for her relief. A prominent physician was called from New York, who gave little hope of any improvement. The circulation was so bad and the heart action so weak that she suffered much from dyspnea. At this time saline injections were given twice a day after a thorough irrigation, beginning with eight ounces and working up to a pint twice a day. This amount was allowed to remain after the irrigation. These injections raised the blood pressure, as shown by the readings from the instruments, and also from the physical symptoms, such as pressure, headache, etc. It is now two months since the treatment was begun. The blood pressure has risen from 40 to 80 mm. mercury. The blood count increased from erythrocytes, 1,040,000; leucocytes, 2,340; hemoglobin, 20 per cent.; to erythrocytes, 2,381,000; leucocytes, 3,800; hemoglobin, 43 per cent. She has improved very much in every way, and goes about like other people. After trial with all other things with absolutely no effect on the condition, it was a great satisfaction to see these results from the saline injections. The saline fluid should be retained so that it can be absorbed.

DR. ALLEN A. JONES, Buffalo, said that in a series of 8 cases of pernicious anemia that came into his hands since Oct. 1, 1906, in private and consultation practice, one patient was 70 years of age, one 63, another 55, and the rest between 40 and 60, excepting two women whose ages were 33 and 29, respectively. With regard to the blood picture in pernicious anemias, there is the low red cell count, with a change in the color index and the large cell type. Also it is not always easy to find the megaloblasts; he did not think we should rely on the presence of megaloblasts to come to a definite diagnosis of pernicious anemia if other things were present. Before arriving at a positive diagnosis a study of the stomach should be made; in the majority of these cases of pernicious anemia there is found a complete suspension of the secretory function of the stomach, an achylia gastrica. This is so common that Dr. Jones regards it as of considerable value. He spoke of cases, of course, in which he could exclude the secondary anemias. He depends in iron therapy on the use of the Blaud pill, well prepared, in preference to the proprietary preparations. He feels that he loses valuable time if he places his patients for weeks or for months on the proprietary preparations of iron. If one gets a good Blaud pill he will get decided and good results, not only in cases of typical chlorosis, which are rare, but in many cases of secondary anemia. With regard to the treatment of pernicious anemia, occasionally it was his experience to find a patient improve so decidedly under treatment that he continues well for years. Dr. Jones has under observation a woman in Pennsylvania illustrating this point. It is remarkable how she improved under the use of arsenic. Why, he does not know. All physicians are familiar with the marked improvement that occurs in some cases under the use of arsenic.

DR. STANLEY P. BLACK, Los Angeles, Cal., discussing Dr. Cabot's paper, said he believes that Dr. Cabot is not justified in separating Class 1 into two groups. There is no question in Dr. Black's mind but that all forms of anemia have a cause, and that there is no such thing as a primary anemia. When called primary anemia it is because of our ignorance or inability to find the cause. So *Bothriocephalus latus* anemia and other forms of anemia of toxic nature should be left in the same class; they have the same blood picture. He thought that ultimately the cause of all the anemias would be found. With regard to the physical signs in chlorosis, there is one sign that is frequently present in these cases, a hypoplasia of the genitalia and cardiovascular system. This is frequently found in chlorosis and is an important factor in the diagnosis. There is another type of blood picture that Dr. Cabot has not mentioned, practically a preliminary picture in secondary anemias, the chlorotic type, in which the hemoglobin is reduced, but the red cells are not reduced to the same limit. After severe hemorrhages there is an immediate reduction in the number of red cells; but the hemoglobin falls *pari passu*, the color index being normal. After a certain length of time, the hemoglobin is diminished and we get the same blood picture as in chlorosis. This type is found very often in secondary anemias before they reach the chlorotic stage.

DR. ABRAHAM J. HOBSON, Hampton, Iowa, said that, as a practitioner in a country town of about 3,000 inhabitants, he has been struck with the frequency of pernicious anemia there. In his practice covering a period of twenty years he saw at least 20 cases, and in none of them was there any doubt as to the diagnosis. A careful examination had been made and the diagnosis was based on the blood findings; some had been diagnosed by specialists in Chicago. He has at present three cases in his own practice and two cases seen in consultation. He asked: "Is pernicious anemia more common in Iowa than it is elsewhere in this country?" These five patients are all women, the youngest 35, the oldest 65 years old. All are farmer's wives and well to do, and therefore the anemia could not be the result of starvation.

DR. FRANK SMITHIES, Ann Arbor, Mich., said that whatever form of anemia presents itself, an exact diagnosis can only be obtained by study of the complete picture—the clinical manifestations as well as the findings from careful examinations of the blood. With regard to the treatment, he wished to lay special emphasis on rest, fresh air and proper diet. By rest, he meant absolute rest in bed, often for a long time. In particularly severe cases, ice bags over the precordia do much to control dilatation and slow the pulse. By fresh air, he means outdoor air, the patients being in the sunshine eight or ten hours daily. They should be carefully protected from the rays, to guard against sunburn. With regard to diet, he has seen many cases in which careful feeding—sometimes by the spoonful, at short intervals—had carried patients over blood crises, where all forms of medication had accomplished nothing. In ordinary cases he has seen the best results come from a rich albuminous diet, with plenty of raw meat and egg. He was glad to note that a previous speaker had mentioned the importance of stomach analyses in anemics. In pernicious anemia especially, he had found achylia common. In these patients, hydrochloric or tartaric acid should be supplied, and in the cases of low motility, lavage should be given. In reference to the finding of low blood pressure which one of the speakers had mentioned, this is so commonly found in diseases not due to anemia that he did not consider it of diagnostic value. He had used the Erlanger apparatus and found that low systolic and diastolic pressures are the rule, but the findings have but rarely been of great value in directing therapy. He, too, had noted the large number of cases which came to Dr. Dock's clinic from the country-side. He had, however, always considered that this was because of the geographic situation of Ann Arbor, rather than that the disease was especially peculiar to farmers. The disease is rarely recognized in the villages and small towns, and consequently the cases drift into institutions or larger cities. He

thought, however, that this point might be worth investigating. Perhaps, then, some definite regions of origin might be discovered.

DR. NORMAN BRIDGE, Los Angeles, Cal., said that he failed to hear mentioned the one medicament of great value in chlorosis. This drug is pre-eminently valuable in chlorosis as a therapeutic measure capable of increasing the hemoglobin of the blood. It has been shown, and clearly enough, he believes, that iron in many of these cases is of little value. The one drug he had in mind was calomel in tonic doses—not cathartic doses—that is, from 1/50 to 1/30 of a grain, given three times a day, but not oftener. How it works or operates he does not know or pretend to know. But that it has a power vastly greater than the iron preparations in securing good blood and increasing the iron in the blood, there was no question in his mind. It should be given at least a month continuously, and there is, of course, no objection to giving at the same time iron or any better tonic—or all together.

DR. C. H. BUNTING, Charlottesville, Va., referred to the multiplicity of the causes of pernicious anemia. Dr. Cabot has divided this type into pernicious anemia and the anemia due to parasites. Experimental work has shown that one may expect to find a multiplicity of causes, because various toxins can be used to produce the same picture in animals. In human pathology, then, one may have a variety of causes producing the condition in the blood which is described as the picture of pernicious anemia. He believes that the great majority of the cases, however, which are recognized as cases of pernicious anemia are due to practically the same cause; this is true, although clinically and pathologically one can not separate the cases which are due to a parasite from those which are due to unknown causes. As to the treatment, there is one suggestion to be made from the pathologic side: Rest, fresh air and diet are very important in enabling the bone marrow to produce and reproduce new red cells. But the essential thing must be the removal of the cause. In the *Bothriocephalus latus* anemias we have a good example of what results when the cause is removed, recovery. Consequently, he believes that we have one certain indication in every case of pernicious anemia, and that is the careful treatment of the gastrointestinal tract.

DR. BAILEY K. ASHFORD, Washington, D. C., said that he approved of Dr. Hutchinson's remarks regarding the influence of iron. Iron is of value in certain cases of uncinariasis in which the recovery is slow; in such cases iron does well. But ordinarily iron is not necessary. As to the possibility of uncinarial anemia being produced by a toxin, we have not yet been able to demonstrate any such toxins, but there are certain facts which might make this probable in uncinariasis. He wished to call attention in this connection to the hyaline degeneration of the arteries of the Malpighian corpuscles of the spleen.

DR. RICHARD C. CABOT, Boston, said that Dr. Bunting's classification of anemias into primary and secondary is simply a question of convenience; there is the same clinical picture and pathologic anatomy in the anemia from *Bothriocephalus latus* as in pernicious anemia. It is merely convenience that makes us call one primary and the other secondary. Dr. Cabot said that Dr. Ashford's work in Porto Rico is really a campaign against a disease of the whole people, for a considerable majority of the population of Porto Rico have uncinariasis. Now through the energy and honest effort of Dr. Ashford the island is likely to be freed of the disease. Dr. Cabot said that he never hears or speaks of this disease but that he feels the greatest debt of gratitude to Dr. Ashford for what he has done toward saving the population of this island from inefficiency and from disease. In regard to the existence of pernicious anemia in the rural districts Dr. Cabot said that out of 337 cases he has seen, more than two-thirds come from the rural districts; whether a coincidence or not, this certainly is a striking fact. Pernicious anemia will be found to be a common disease in every part of the country if it is looked for. Pernicious anemia is ten times more common than myxedema and five times more common than leukemia. Dr. Cabot has tried saline injections, as he has tried many other treatments for pernicious anemia. Out of the 337 patients with pernicious anemia three are alive, and he does not believe they got well by reason of what he did for them. This fact made him rather slow in accepting anything in the way of therapeutic measures, whether intestinal flushings, or arsenic, or rest, fresh air, which he always gives, or anything else. He has never been able to make up his mind that arsenic does any good.

DR. S. J. MELTZER, New York, said that it is not fair to bring up here the fatal case in Philadelphia as an argument against the value of direct transfusion as a method. The case may prove, if it proves anything, that in certain pathologic states transfusion is inadvisable. Crile, however, introduced the method of direct transfusion primarily for anemias caused by hemorrhages of traumatic origin. In these cases the direct transfusion apparently renders excellent service. The method, therefore, marks a distinct progress in the treatment of anemia, and that is all Dr. Meltzer claimed for it. The celebrated clinician, Niemeyer, is quoted as saying that his success was due to the use of iron in chlorosis. He gave Blaud's pills in large quantities. Dr. Meltzer would advise other physicians to do the same, the opinion of some physiologic chemists and hematologists notwithstanding. The history of the pharmacology of iron for the last twenty-five years teaches that, in the practice of medicine, the clear-sighted clinician is very frequently a safer guide for the practitioner than physiologic chemists, some of whom venture to offer positive opinions in fields in which they possess neither theoretical nor practical personal experience.

AN INVESTIGATION OF THE NATURE OF PROTEID-SOAP COMPOUNDS AND OF THE STAINING OF PURE FATS AND LIPOIDS BY SCHARLACH R AND SUDAN III.*

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These studies were undertaken for the purpose of further investigating certain reactions on which Klotz[1] bases in large part his interpretation of pathologic calcification and which, as his interpretation is not in accord with that reached by Wells[2] and independently by me,[3] are matters of considerable importance in the elucidation of this interesting problem.

The observations in question are those concerning the value of the so-called proteid-soap compounds and of the staining of fats and lipoids by Sudan III and Scharlach R.

PROTEID-SOAP COMPOUNDS.

Klotz, as the result of a series of microchemical examinations of various kinds of calcified tissues, concluded that the deposition of lime in tissues undergoing calcareous degeneration is dependent on the formation of calcium soaps as an intermediate step. He further states that an essential factor in the production of these soaps is the initial combination of a soluble soap and an albuminous substance. He does not assume, however, that this is the essential process in all varieties of pathologic calcification, but states that in exceptional cases there may be two other possibilities: First, "that under certain conditions the calcium salts act directly on the neutral fats present in the degenerating cells."

* From the Department of Physiological Chemistry, Bender Laboratory, Albany, N. Y. This investigation was pursued under a grant made by the Committee on Scientific Research of the American Medical Association.

1. Studies on Calcareous Degeneration, I. The Process of Pathological Calcification, Jour. Exp. Med., 1905, vii, 633.
2. Pathologic Calcification, Jour. Med. Research, 1906, xiv, 491.
3. Chemistry of Atheroma and Calcification (Aorta), Jour. Med. Research, 1906, xv, 355.

or, second, "that the neutral fats are first broken down into fatty acids and that these react with the calcium salts to form the soaps."

As he was convinced that the combination of soaps with proteid is a necessary intermediate product in certain forms of calcareous degeneration, he attempted to reproduce the reaction in the test tube. To a weak solution of a soap (sodium stearate, oleate or palmitate), a dilute solution of egg albumen was added. In a half hour or longer, at room temperature, a white flocculent precipitate appeared. This he considered to be a combination of the soap and the egg albumen. When this product was treated with Sudan III the same pinkish color, visible in the "soap" granules in tissues undergoing calcification, was seen to be present. The amount of precipitate, he states, is further increased by the passage of carbon dioxid (CO_2) through the solution. Acid calcium phosphate, which does not affect simple solutions of egg albumen, when added to a mixture of egg albumen and soap causes a rapid and dense precipitation.

As microchemical reactions in tissues are notoriously unreliable and controlled only with great difficulty, these reactions in the test tube necessarily formed the basis of Klotz's theory and their explanation is, therefore, of the greatest importance.

The first step in the present investigation was to determine the nature of this precipitate, that is, whether a real combination of proteid and soap does occur, and if not, to ascertain the actual composition of the precipitate. These experiments were carried out with egg albumen and the blood serum of horses. The soluble soaps used were sodium stearate and sodium oleate. In repeating the experiments of Klotz an identical reaction was obtained, that is, on the addition of the soap solutions to the egg albumen or horse serum a flocculent precipitate appeared which gradually increased in amount and reached its maximum at the end of twenty-four hours. In order to determine whether or not this was the result of a true combination of proteid and soap or merely a precipitation of some substance in the mixture, the following experiment was performed: Two lots of 100 c.c. each of horse serum were taken; to one, 100 c.c. of distilled water were added, and to the other 100 c.c. of freshly-prepared 5 per cent. sodium oleate solution. At the end of twenty-four hours a finely granular precipitate was visible in the serum-water mixture, while in the serum-soap solution a copious flocculent precipitate appeared. These were filtered and yielded clear straw-colored filtrates. In order to determine whether or not any combination of proteid had taken place in the soap-proteid mixture, duplicate total nitrogen determinations were made, by the Kjeldahl method, on aliquot parts (5 c.c.) of each of the filtrates. The results were as follows:

TOTAL NITROGEN.

SERUM AND WATER MIXTURE.	SERUM AND SOAP MIXTURE.
$\frac{N}{10}$	$\frac{N}{10}$
20.15 c.c. of — acid.	20.15 c.c. of — acid.

From these figures it is easily seen that the nitrogen (proteid) contents of both filtrates was the same and that no more nitrogen was thrown out of solution by the soap than by the water alone. This finding is of considerable importance, for if a true combination of proteid and soap had taken place the filtrate obtained after the removal of the precipitate would have contained less nitrogen (an indication of soluble proteid) than the filtrate from the serum-water mixture, where no combination was suspected. As this did not occur, the conclusion is inevitable that the precipitate is not a proteid-soap compound, but must consist of a mixture of other substances thrown out of solution.

In order to throw more light on this reaction, experiments were made to determine the influence of the colloids (globulins, albumins) and salts of the serum and egg albumen in the precipitation of the soaps.

GLOBULINS.

The fact that Klotz emphasized the increased precipitation after the passing of carbon dioxid through the fluid suggested the possibility of the globulins of the serum being the main constituent of this precipitated material. It is a well-known fact that globulins are precipitable from neutral solution on addition of carbon dioxid gas. Globulins, therefore, were prepared from normal horse serum in the usual way (ammonium sulphate method with dialysis). The globulin thus obtained was dissolved in a 10 per cent. solution of sodium chlorid and a small quantity of it added to a weak solution of sodium stearate. Immediately a heavy flocculent precipitate appeared. As a control, however, a 10 per cent. solution of sodium chlorid was added to a solution of the soap, and an apparently identical precipitation occurred.

It was evident, therefore, that the material precipitated in the first instance was not the globulin but the soap. This reaction is analogous to the salting out of soaps in their commercial manufacture. In an attempt to exclude this factor the globulin was put in solution with the smallest possible quantity of salt, but in every case control experiments using solutions of the same strength of sodium chlorid showed an equal and similar precipitation. The only part then which the globulin can play in this precipitation lies in the reaction noted above in which the globulin of the serum or of the egg albumen can be precipitated by the addition of water alone.

INORGANIC SALTS OF THE BLOOD SERUM AND EGG ALBUMEN.

To a weak solution of sodium stearate, an equal quantity of physiologic sodium chlorid solution was added. As control, an equal quantity of distilled water was added to another portion of the sodium stearate solution. At the end of twenty-four hours a precipitate was visible in both tubes, but was more marked, however, in the sodium chlorid solution. In the sodium stearate and water mixture the precipitate was finely granular and, to a certain extent, diffuse, while in the soap-sodium chlorid mixture it was more flocculent and the supernatant fluid slightly translucent.

As a further control, a solution of the normal salts of the serum were obtained as follows: One hundred c.c. of horse serum were added to 400 c.c. of distilled water. The mixture was then boiled and the proteid coagulated by the careful addition of acetic acid. The filtrate, clear and colorless, was then evaporated to dryness to remove the excess of acetic acid and by the addition of distilled water was brought up to the original volume of the serum. A similar solution of salts of egg albumen was obtained after removal of the coagulable proteids. To 10 c.c. of each of the proteid-free solutions 10 c.c. of sodium stearate solution were added. At the end of twenty-four hours a precipitate was visible which, although much finer in appearance, approxi-

mately corresponded to the precipitate formed by the addition of the physiologic sodium chlorid solution to the sodium stearate. As the result of these tests it may be stated that while the inorganic salt content of egg albumen or of serum does not probably cause the whole of the voluminous precipitate obtained on addition of soap to the proteid, it is a factor in the production of a small amount of it.

In this connection attention must be called to the calcium content of the egg albumen (1.7 to 2.9 per cent. of the ash) and blood serum (.015 per cent. of the serum). In both of the reactions with these fluids and the soaps this calcium is undoubtedly a factor in precipitating this latter as calcium compounds.

ALBUMINS.

The effect of salt-free albumins was then investigated. These were prepared by dialyzing egg albumen and horse serum for about ten days or until tests for chlorids were negative. In each instance the precipitated globulins were filtered off; in the case of the serum a small amount of water soluble globulin probably still remained in solution. Comparing solutions of albumins so prepared plus stearate soaps with the control solutions of egg albumin and serum albumin respectively in water, at the end of twenty-four hours no difference was visible. In all the tubes a very small amount of a very finely granular precipitate occurred.

These reactions render it probable that the albumins do not enter into the composition of the precipitate which is formed when the soaps react with the egg albumen. In order, however, to exclude the possible factor of the albumin inducing a "colloidal precipitation" experiments were performed with other colloid substances, for instance, gelatin and starch. With gelatin a marked precipitation was apparent with the soaps, but as the admixture of calcium salts with this substance could not be eliminated, solutions of other colloids like starch were tried.

A rather fluid starch paste was prepared. Some of this was added to equal amounts of egg albumen and blood serum. In both cases a somewhat gelatinous precipitate occurred which was shown to consist of starch. Solutions of starch added to the soap solutions caused a precipitate which was analogous to that produced by water alone. Apparently, therefore, colloids may precipitate starch from solutions as well as soaps, but the reverse does not occur.

Thus far only a small amount of the precipitate has been accounted for. We have shown that the inorganic salts of the serum are responsible to a slight extent in the precipitation of the soaps; the albumins on account of their colloidal nature, possibly also in the same degree, while the globulins enter only slightly into the composition of the precipitate as a result of the dilution of the mixture by the solutions added.

FATTY ACIDS.

The changes occurring in soap solutions suggested the possibility of fatty acids playing a part in the precipitate. For example, a weak solution of sodium stearate or oleate freshly prepared and filtered is translucent and free from any precipitate. When tested with litmus it is alkaline in reaction. If it is allowed to stand for twenty-four hours a granular precipitate in the case of the stearate, gelatinous in the case of oleate, gradually appears.

If the precipitates are filtered off and the filtrates allowed to stand for twenty-four hours a similar precipitate reappears. This precipitate is insoluble in water, but dissolves readily in ether and chloroform. Such a chloroform solution reacts acid to litmus and contains fatty acid. These facts just outlined can be easily explained. Part of the soap on passing into solution undergoes dissociation and hydrolysis with the production of sodium hydroxid (NaOH) and free fatty acid. The mixture, therefore, becomes alkaline and the fatty acid gradually precipitates. This passes into solution in the chloroform.

With these changes in mind, the proteid-soap compounds were examined as follows: A quantity of the precipitate obtained on the addition of a sodium oleate solution to egg albumen in suspension was now shaken up with the neutral chloroform and found to a great extent to be soluble. Tested with litmus, the chloroform reacted acid to litmus and the neutral point was only reached after the addition of a definite amount of a decinormal solution of sodium hydroxid. This observation, therefore, demonstrates conclusively that the major portion of the precipitate which Klotz considers to be a proteid-soap compound is composed of fatty acids.

Fatty acids may also be thrown out of solution on the addition of weak acids. If carbon dioxid (CO_2), which in aqueous solutions is a weak acid, be passed through a solution of soap, a flocculent precipitate gradually separates out, which when taken up in chloroform and tested, reacts acid to litmus. In the formation of the hypothetical proteid-soap compound Klotz emphasized this increased precipitation on the addition of carbon dioxid. He further states that the precipitation is increased by the addition of a solution of acid calcium phosphate. This reaction is, of course, due in part to the precipitation of the fatty acids by the acid solution and also to the formation of insoluble calcium soaps by the addition of a soluble calcium salt.

To summarize briefly: The so-called proteid-soap compound does not exist. The material may be due in small part to a precipitation of the soaps by the inorganic salts of the serum or egg albumen and in small part to globulins thrown out of solution. An equally small part is caused by a precipitation of the soaps or fatty acids by the colloid substances in the serum and egg albumen. The main portion of the precipitate, however, consists of fatty acids obtained from a hydrolysis taking place in the soap solutions.

THE STAINING OF FATTY COMPOUNDS WITH SUDAN III AND SCHARLACH R.

Klotz states that the soaps are ready solvents for Sudan III. He attempts to demonstrate this by making a concentrated aqueous solution of the soap and adding powdered Sudan III. He states that the clear deep red solution which results can be filtered, diluted and, when evaporated to dryness, yields pinkish yellow areas which are distinguishable from the golden-red staining fat. He cites the statement of Fischler, who asserts that Sudan III is soluble in soap solutions, but who further states, however, that the soap when stained with Sudan III rapidly loses its color when treated with 70 per cent. alcohol, the color being transferred to the alcohol. With this latter statement Klotz fails to concur wholly. He admits that this is true in regard to soap solutions in the test tubes, but states that soaps in the tissue are less soluble in weak alcohols. The retention of the stain there, he thinks, is due to the combination of the soaps and proteids already discussed. These obser-

vations, in view of our experience with the proteid-soap compounds, demand re-investigation.

Scharlach R and Sudan III are soluble in alcohol, chloroform, ether, toluol, acetone, etc., and in certain fats and lipoids. When added to water no color is imparted to the fluid even at the end of several days. It is generally accepted that the stains are insoluble in water.

SOLUBLE SOAPS.

If to a fairly concentrated solution of sodium oleate which has been freshly made and filtered a small quantity of Sudan III is added, after "thorough mixing," no color is immediately imparted to the fluid. Gradually, however, the solution assumes a pinkish color which, after standing for a while, becomes much deeper. At the end of twenty-four hours the solution is colored a deep red. If some of this solution is shaken with ether or chloroform the color immediately leaves the aqueous solution and is transferred to the chloroform and ether. When tested with litmus the solution reacts strongly acid, and if evaporated to dryness, reddish yellow granules of fatty acid are visible under the microscope.

The colorless condition of the soap solutions immediately after the addition of the Sudan III and the gradual reddening of the mixture must be attributed to the same reaction previously described where the soaps slowly undergo hydrolysis and the fatty acids formed thereby gradually assume the stain which eventually colors the solution a deep red. In other words, the deep orange red color is not due to the soaps which have taken up the stains, but rather to the fatty acids formed by hydrolysis and temporarily held in solution by the soaps.

CALCIUM SOAPS.

To a quantity of the original reddened aqueous solution of the soluble soap a quantity of absolute alcohol was added sufficient to raise it to a 70 per cent. alcohol solution. When this alcoholic solution was treated with a soluble calcium salt, a pinkish white precipitate appeared at the end of twenty-four hours, the supernatant fluid remaining deep orange red. The precipitated substance was filtered off; when dried it appears white and very fluffy in consistence. It is insoluble in water, but dissolves in chloroform when a few drops of a mineral acid are added. The precipitate is, therefore, calcium soap which does not take the stain with Sudan III.

In order to prove this point more decisively attempts to stain calcium soaps were made in another manner. Calcium soaps were prepared by the precipitation of the soluble soaps—sodium stearate and oleate—with a soluble salt of calcium. The collected precipitate was thoroughly washed with water to remove soluble salts and afterward with alcohol to remove traces of fatty acids. In the case of the stearate a finely granular opaque white salt was obtained, while with the oleate compound a rather gelatinous material resulted.

A relatively large quantity of the insoluble calcium stearate was suspended in an absolute alcohol solution of Sudan III. As has been previously shown, calcium soaps are rather insoluble in cold absolute alcohol. The suspended material, now filtered off, appears pinkish white. Washed with absolute alcohol, the pinkish color disappears and is imparted to the wash alcohol. The insoluble soap remains opaque white. The pinkish color of the soaps treated with Sudan III is not due to real staining, but is produced by a mere mechanical mixture of the dissolved stain and the insoluble compounds. Attempts which were made to stain these soaps by methods outlined below were also fruitless.

NEUTRAL FATS AND LIPOIDS.

It was deemed extremely important to determine if Scharlach R and Sudan III could be used as differential stains for the various fats and lipoids. Several methods of demonstrating this were tried. For example, the examination of frozen sections of colloids (gelatin, celloidin) and of various fresh and dehydrated animal tissues impregnated with solutions of the fat and lipoids to be examined. These methods were abandoned in favor of the following, which seemed to be more applicable to the problem:

To solutions of fats and lipoids Scharlach R and Sudan III respectively were added. The resultant clear solution was thrown into water and the fats precipitated out of their original solution. This method we considered relatively successful because of the ease with which the stained fat can be separated from the solvent. While the fats are fairly soluble in alcohol and ether, they dissolve much more readily in chloroform, which is also an excellent solvent for Sudan III and Scharlach R. Chloroform also will not mix with water, that is, it is insoluble in that liquid.

If, therefore, a chloroform-Sudan III solution of a fat is added to water the fat will precipitate out, so will the chloroform, although both may be colored red, the fat rises to the surface of the fluid while the chloroform settles to the bottom, allowing an easy differentiation. The chloroform, however, must be removed by evaporation with heat before one may say definitely that the red globules are the fatty compound and not the chloroform. In this method a portion of stain remains adherent to the floating fat, while most of the insoluble stain is suspended through the fluid. It is necessary, therefore, that this fat be not filtered, but skimmed off, redissolved in the solvent and reprecipitated several times in order to be certain that the red color is due to the fat alone and not to any of the insoluble stain which may have been accidentally caught in the suspension. This method, although a cumbersome one, has been found most excellent for determining the staining power of various fats and lipoids. The same method may be used when alcohol is employed as a solvent.

In his original communication Klotz expresses a preference for Sudan III, for while he found that Scharlach R stained more intensely, staining with Sudan III was more satisfactory in that the precipitation of crystals from the saturated solution was more easily obviated. In the method which I adopted this difficulty was not encountered. Scharlach R and Sudan III were used interchangeably. No differences were noticeable in fats and lipoids stained with either Scharlach R or Sudan III except differences which would distinguish the original alcohol solutions. Scharlach R stains fats more intensely, the red being much deeper and more pronounced. Fats stained with Sudan III assume more of a deep orange-red color. The staining of fats by these dyes is dependent on the fact that these dyes are more soluble in the fats than in the solution in which they are originally dissolved.

FATTY ACIDS.

Pure oleic, palmitic and stearic acids were employed in the following experiments:

Oleic Acid.—To a definite quantity of oleic acid a small amount of Sudan III in substance was added; so-

lution occurred immediately and the liquid oleic acid was colored a deep red. This color was much more intense than that of the saturated 70 per cent. alcoholic solution. When the oleic acid was filtered into distilled water it separated as deep red opaque globules. Repeated solution and reprecipitation failed to cause the acid to lose its deep red color.

Palmitic Acid.—The acid was dissolved in absolute alcohol and Sudan III added. The solution was now filtered into distilled water. The acid thrown out of solution was not nearly so deeply tinted as the oleic acid and appeared light red in color. If the fluid on which this reddish fatty acid material was floating is heated to about the boiling point the fatty acid melts into globules which take on an intensely red color exactly similar to that obtained when the stain was dissolved in the oleic acid. On cooling the acid separated out as firm red globules. This material collected and redissolved in absolute alcohol was filtered again into distilled water. The fatty acid which now separated out appeared almost white, the slight pinkish color being due to the color of the fluid in which it was suspended. If, however, pure palmitic acid is heated to its melting point and a few particles of the Sudan III are added the acid dissolves the stain and the fluid takes on the deep red color which was noticed in the case of the oleic acid.

Stearic Acid.—The same results were obtained with this acid.

CHOLESTERIN.

This substance obtained in pure form from gall-stones was treated by the same method. The first precipitate appeared deep red, but further solution and re-precipitation removed all the color until the final material was almost a pure white. If cholesterin is raised to its melting point and Sudan III in substance is added the fluid cholesterin dissolves the stain and takes on the same deep red color noticed with the oleic acid and fluid palmitic acid. This indicates that only when cholesterin is in a fluid state will it take the stain.

NEUTRAL FATS.

Neutral fats were obtained from both mutton and beef suet. Treated in a manner similar to the other fats, the neutral fluid or semi-fluid fats retained their deep red color after repeated precipitations.

LECITHINS.

Lecithins were prepared from the yolks of eggs and from brains dehydrated with dried calcium sulphate. A quantity of egg lecithin dissolved in a chloroform solution of Sudan III was added to water. The deeply red-colored chloroform fell to the bottom of the vessel. On removal of the chloroform by heat over a water bath, the stain came out of solution and suspended itself in the fluid; the lecithin, on the other hand, assumed a swollen pasty condition like a stiff emulsion which retained a distinct salmon-yellow color. This gelatinous material, which could be lifted out of the solution on a stirring rod, was transferred to fresh amount of distilled water, in which it then dissolved, coloring the aqueous fluid a light yellow pink.[4] This indicates that lecithin in solution has the power to stain feebly.

In a second experiment with lecithin a quantity of a chloroform solution obtained from dehydrated brain was added to Sudan III solution. The filtered solution was allowed to evaporate spontaneously and the residue examined under the microscope. Everywhere orange-red globules (lecithin) were interspersed among a yellowish granular material. Lecithin stained with Sudan III, after impregnation in gelatin, also took a salmon-red color. It is obvious, therefore, that lecithin in substance, like the neutral fats, will take and retain the stain.

From these observations it may be concluded that the staining of solutions of the soluble soaps by Sudan III is due to their hydrolysis into fatty acids in which bodies Sudan III and Scharlach R are soluble and which are, therefore, colored by them.

After repeated solution and re-precipitation oleic acid and the neutral fluid fats stained by Sudan III retain their original deep red color. Palmitic and stearic acids and cholesterin, on the other hand, become decolorized by this process and, therefore, can not be stained by these bodies. Lecithin gives a salmon-red color when stained with Sudan III. This is interesting because it places lecithin, so far as staining reaction is concerned, between the fluid fats and the soaps and solid fats.

According to Michealis,[5] the staining of fats by Sudan III is purely a physical and not a chemical process, but he admits that the physical properties of a body depend on its chemical character. He considered the union between Sudan III and oleic acid a physical one depending on the property of the unsaturated fatty compound in becoming oxidized. While this may be an explanation for the retention of the stain by the oleic acid, neutral fats and perhaps lecithins containing oleic acid radicals and the non-retention by the palmitic and stearic acids, the fact that other crystalline lipoids like cholesterin act similarly to the crystalline fatty acids suggest that the question as to the staining of the substance depends on its physical condition entirely.

This is particularly emphasized in the experiments with palmitic and stearic acid and cholesterin, where it was shown that when these substances were transformed by heat to their fluid condition they dissolved the stain immediately. On return to their solid state, however, they refused to retain the dye. Again those fatty compounds which at room temperature are fluids or semi-fluids are those which hold the stain even after repeated solution and reprecipitation.

This explains the cause of the discrepancies in the statements of various authors[6] as to the staining of fatty acids with Sudan III or Scharlach R.

It is believed that the results obtained warrant the statement that only those compounds of a fatty nature take these stains when they possess the physical characteristics of a fluid or semi-fluid at room temperature; other substances which allow of liquefaction by increase of temperature also react to the dye when in their fluid state. Such substances are butyric acid, oleic acid, triolein, tributyrin and lecithin. Palmitic and stearic acids and their neutral glycerids and cholesterin come into this group when the temperature is above their melting point.

The results show that neither calcium nor sodium soaps, palmitic nor stearic acids will at room temper-

4. Koch: Zeit. f. physiol., Chem., 1903, xxxvii, 181.

5. Ueber Fett Farbstoffe, Archiv. f. Path. Anat. und Physiol., 1901, clxiv, 263.

6. Daddi (L.): Nouvelle méthode pour colorer la graisse dans les tissue, Arch. Ital. de Biol., 1896, xxvi, 142; Rieder (H.): Ueber die Verwendbarkeit des Farbstoffes Sudan III in der klinischen Mikroskopie, Deutsch. Arch. f. klin. Med., 1897, lix, 444; Handwerck (C.): Beiträge zur Kenntniss vom Verhalten der Fettkörper zu Osmiumsäure und zu Sudan, Zeitschr. d. Wissensch. Mikroskopie, 1898, xv 177.

ature take the stain with Sudan III or Scharlach R, hence the material staining by these substances which Klotz described as occurring at certain stages in calcareous degeneration can not be any of these compounds. In all probability it is a mixture of oleic acid, triolein and lecithin. This agrees with the findings which I have reported as a result of the chemical analysis of aortas in various stages of calcification.

GENERAL CONCLUSIONS.

1. The so-called proteid-soap compound of Klotz is not a true chemical combination, but a mixture made up mainly of fatty acids with small amounts of calcium soaps and globulin.

2. Sudan III and Scharlach R stain substances of fatty nature only when they are in fluid or semi-fluid. As oleic and butyric acid, triolein, tributyrin and lecithin are in this state at room temperature, they form a group to which must be limited the application of microchemical methods.

THE METHOD OF DETERMINING THE TOTAL AMOUNT OF THE FECAL BACTERIA BY WEIGHT AND ITS CLINICAL SIGNIFICANCE.*

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PHILADELPHIA.

The most accurate method of estimating the total amount of bacteria in the feces is that devised by Strasburger,[1] which determines the actual dried weight of all the bacteria whether living or dead.

Attempts to form an idea of the proportion of bacteria in the feces by plating a given quantity and then counting the colonies is inaccurate for several reasons—principally because a large proportion of the intestinal flora die in their passage through the colon and only a relatively small number of micro-organisms can be cultivated from the stool. Moreover, the different portions of a stool are far from homogeneous, and what is true of one portion will not be true of another.

It must be remembered that results obtained by Strasburger's method are entirely quantitative. No distinction is made between the putrefactive and fermentative bacteria, but the whole bulk of the intestinal flora, living and dead, is measured. Which form of bacteria predominates must be ascertained by other means, chiefly by cultivation, although Ehrlich's aldehyd reaction and the reaction of the feces to litmus may be of some assistance.

Through the use of Strasburger's method various facts have been determined concerning the intestinal bacteria, of which many are new and some are at variance with the received ideas of the physiology of the intestines.

DIET AS A FACTOR.

The diet is probably the most important factor in determinating the amount of bacterial growth in the intestines. Foods that are easily digested and well absorbed comparatively early in their passage through the gastro-intestinal tract leave little or no residue on which the bacteria can live—consequently under such a diet the bacterial count will be low under almost any circumstance. When the diet contains foods which are hard to digest and in which the residue is large the reverse is the case. Consequently the sort of diet must always be taken into consideration in interpreting the amount of fecal bacteria. This is easily seen in Table 1, consisting entirely of normal cases. The following is a summary:

Full home diet gave 18.1 to 20.5 per cent. bacteria.
Full hospital diet gave 18.2 to 21.1 per cent. bacteria.
Semi-liquid hospital diet gave 15.6 per cent. bacteria.
Milk diet gave 13.2 per cent. bacteria.

The great influence that diet has on the intestinal bacteria suggests that the best remedy for excessive bacterial action in the bowel is modification of the diet.

TABLE 1.—NORMAL CASES.

Sex and Age.	Diet.	Stool.	Per Cent. Bacteria	Grams per Diem.		Length of Observation.
1. Male; 38 yrs.	Full home diet	Formed; alkaline; brown.	20.5	7.4	6	consecutive days.
2. Same case....	Same.....	Same.....	18.1	7.4	4	consecutive days.
3. Male; 30 yrs.	Full hospital diet.	Formed; alkaline.	19.1	....	2	consecutive days.
4. Same case....	Milk diet; 2 qts. daily.	Formed; alkaline; brown.	13.2	....	2	consecutive days.
5. Female; 45 yrs.	Semiliquid hospital diet.	Formed; alkaline.	15.6	2.2	3	consecutive days.
6. Male; 30 yrs.	Full hospital diet.	Formed; alkaline.	21.1	4.9	Same.	
7. Female; 40 yrs.	Full hospital diet.	Formed.	18.2	2.7	Same.	

NATIONALITY AS A FACTOR.

The percentage of bacteria in the feces of American subjects taken from hospital patients and normal persons of the more prosperous class—professional men and private patients—is lower than that given for Germans by Strasburger, who says that he finds that a quarter to a third of the dried weight of the stool is bacteria. This difference in our results is probably to be explained by the fact that the diet is not the same in the two countries. Further investigations in America may show that classes of society who employ coarse foods may show a higher percentage of bacteria. In any event, the proportion of bacteria in the feces is probably higher than has been usually supposed, and this must be considered in estimating the total nitrogen of the stool. The presence of bacteria would furnish an amount of nitrogen that would lead to very confusing results in metabolic work unless the amount of bacteria present was determined and allowances made for this source of error.

BACTERIAL INCREASE.

The bacteria of the feces are *increased:*

1. In conditions in which there is excessive bacterial growth in the stomach, such as achylia with diarrhea; one such case showed 38 per cent. The great influence of a modification of diet in restricting bacterial growth under these circumstances is shown by a case of carcinoma of the pylorus with partial obstruction in a woman of 60 years. There was a great amount of putrefactive and fermentative change in the stomach, with considerable retention but not complete obstruction. Notwithstanding the number of micro-organisms that must have escaped into the bowel through the pylorus, the bacteria in the stool were but 3 per cent., showing that not enough food material came through the pylorus to per-

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

* From the Clinical Laboratory of the Presbyterian Hospital in Philadelphia.

1. Strasburger: Ztschr. f. klin. Med., 1902, xlvi, 5 and 6; 1903, xlviii, 5 and 6.

mit of much bacterial growth in the bowel. Later, when the pylorus became more patulous (probably through the separation of a slough) and the retention disappeared, the bacteria rose to 22 per cent.

2. In two cases of hyperacidity—one with diarrhea—the bacteria went as high as 28.5 per cent. on a hyperacidity diet containing a large proportion of proteid and fat and consequently with little residue. I believe this represents a high proportion of bacteria for such a diet. This increase in bacterial growth in hyperacidity may be due to insufficient digestion or to the chemical irritation of the excess of HCl. The reason why a chemical irritant, that is in itself an antiseptic (as HCl), may be associated with abundant bacterial growth in the intestine may be explained on the assumption that the normal intestine has a certain power of self-protection against bacteria. Whether this power lies in the intestinal wall, as suggested by Schültz,[2] or in the antagonism that the colon bacilli of the bowel offers to excessive growth of other micro-organisms (Herter[3]), I do not know. But there seems to be good reason to believe that the normal intestine does possess some such protective power and that anything that interferes with the normal functions of the bowel will probably disturb this inhibitory property. Consequently an excess of HCl may favor bacterial growth for the reasons just given.

3. Poor starch digestion in one case gave 27 per cent. When the starch of the diet was reduced in quantity to one-half of what it had been the bacteria fell to 14 per cent. The reaction of the stool in this case was strongly acid.

4. The bacteria were increased in one case of chronic cholecystitis to 38 per cent. (full diet). One case of gumma of the pancreas gave 22 per cent. (liquid diet). Both of these diagnoses were confirmed by operation; two cases of intestinal indigestion showed high percentages of bacteria.

5. The growth of the intestinal bacteria is increased by the administration of various so-called intestinal antiseptics.[4]

BACTERIAL DECREASE.

The fecal bacteria are decreased in amount:

1. In diets leaving small residues, for reasons given above.

2. In uncomplicated constipation usually spoken of as atonic. Schmidt and Strasburger have shown that in uncomplicated constipation the ingested food is too thoroughly absorbed in its passage through the gastrointestinal tract, consequently very little residue is left on which the intestinal bacteria may grow, and as a result the proportion of bacteria in the feces is reduced to 20 per cent. or under. Schmidt suggests that the products of bacterial action, such as gases and various aromatic substances, may be necessary stimulants for the normal activity of the intestinal muscles, and when this is absent constipation results. I am inclined to agree with Schmidt that certain forms of constipation may be caused in this manner. Other cases of constipation showed no diminution but an increase of bacteria (Table 2).

3. The intestinal bacteria are not increased in jaundice. If the older idea and teaching was true, namely, that bile is an antiseptic and that one of its functions is to prevent excessive bacterial activity in the intestine, then we would expect the bacteria to grow more luxuriantly when bile is absent from the intestine. This is not the case, however. In one case of gallstones and jaundice the bacteria were much diminished (see Table 3, Case 1). Strasburger says that in his cases of simple jaundice the bacteria were very low. I am inclined to believe that the reduction in the bacteria in jaundice occurs because the diet is usually reduced in such conditions and not because the absence of bile inhibits bacterial growth.

TABLE 2.—INTESTINAL BACTERIA INCREASED.

Age and Sex.	Clinical Diagnosis.	Date.	Diet.	Stool.	Per Cent.	Grams per Diem.
1. Female; 25 yrs.	Hyperacidity 33-34; very constipated; gastroptosis and dilatation.	Oct. 26.	Eggs and milk.	Hard; scybalous.	28.3	
2. Female; 35 yrs.	Achylia with diarrhea.	Oct. 26.	Light mixed diet.	Badly digested; lumpy; soft.	30.4	
		Oct. 27.	Same.	Same.	30.7	4.1
		Oct. 30.	Same.	Same.	38.0	5.4
		Oct. 31.	Same.	Liquid.	30.2	
3. Male; 48 yrs.	Chronic cholecystitis; operation; anacidity; no jaundice.	Nov. 7.	Schmidt.	Formed.	32.3	
		Nov. 8.	Same.	Same.	30.0	
4. Male; 45 yrs.	Poor starch digestion; neurasthenia; hyperacidity; starch reduced ½.	Feb. 4.	Hyperacidity.	Foul; liquid; acid.	27.0	
		Feb. 8.	Starch reduced.	Neutral.	14.0	
5. Female; 50 yrs.	Abdominal pain and flatus.	.....	Full home diet.	Formed and brown.	26.4	3.4
6. Male; 30 yrs.	Gumma of pancreas; operation; no jaundice.	.....	Milk; toast; oatmeal.	Brown, formed, neutral, offensive. Bile slight. Fat not noticeable.	22.1	4.05

TABLE 3.—BACTERIA DECREASED.

Age and Sex.	Clinical Diagnosis.	Diet.	Stool.	Per Cent.
1. Male; 52 yrs.	Gallstone colic; jaundice; all symptoms mild.	Milk and eggs.	White; pasty; acid; much fat; no bile.	2 0
Same.	Still jaundiced.	Full diet	Alkaline; brown; bile present.	10.5
2. Female; 25 yrs.	Chronic constipation; period of passage 48 hours; "atonic constipation."	Schmidt.	Brown; formed; hard; microscopically no food remnants.	9 82

4. Certain intestinal antiseptics reduce the growth of the intestinal bacteria decidedly. In my own experience this result has been obtained by the use of bismuth salicylate and betanaphthol given by the mouth in normal persons. Because this result was obtained in normal individuals it does not necessarily follow that the same result would be obtained in cases in which the functions of the intestines are disturbed. Indeed, as I have said, it has been the experience of others as well as myself that various antiseptics given under such circumstances increase rather than diminish the growth of the intestinal flora.[5]

THE TECHNIC OF THE METHOD.

The possibility of separating the bacteria from the rest of the feces depends on the fact that the bacteria are so nearly of the same specific gravity as distilled water that they can not be centrifugalized out of a watery suspension of the feces, but remain suspended in

2. Schültz (R.): Archiv. f. Verdauungskrank., 1901, p. 58.
3. Herter: Bacterial infections of the digestive tract, New York, 1907.
4. Steele (J. Dutton): Experimental Observations on the Value of Intestinal Antiseptics, Trans. of Assn. of Am. Phys., 1907.
5. Schmidt and Strasburger: Fæces des Menchen, second edition, Berlin, 1905, 4; also Steele loc. cit.

the supernatant fluid. Taking advantage of this, the bacteria can be removed by washing with the centrifuge. Then if the specific gravity of the wash-water is lowered by the addition of large amounts of alcohol the relation of the bacteria to the fluid is changed to such an extent that the micro-organisms can be readily centrifugalized out, separated, dried and weighed.

Unless the period of passage of the feces has been ascertained to be normal it is better to mark the beginning and end of each period of examination by carmin. The use of the Schmidt diet is not necessary. Indeed, I have found that this diet is not desirable because it leaves very little residue and so of itself reduces the total amount of bacteria to a lower point than that which is usually found.

The whole stool is saved. Unless the feces are liquid they are rubbed up with a known amount of distilled water until they are smooth and semiliquid and as homogeneous as it is possible to make them. This is a modification of my own, intended to make it easier to obtain a specimen of the stool that is fairly indicative of the average amount of bacteria contained in each cubic centimeter. Strasburger takes out but 2 c.c. of the formed feces. It seems to me that since the different portions of the stool differ so in consistency and composition this method of Strasburger leads to considerable error. I believe that this modification insures a much more accurate idea of the total bacterial content of the stool.

Two portions of 5 c.c. are measured off with a pipette of large caliber. I use for this purpose an ordinary 5 c.c. pipette with the tapering end cut off and with the necessary correction made at the upper mark. One of these portions of 5 c.c. is put into a porcelain dish and dried over a water bath and later in a drying oven in order to determine the dried weight. The addition of a little alcohol and thorough mixing will hasten the process of drying and prevent caking of the feces.

The second portion is washed free from bacteria. This is done as follows: The wash-water is 0.5 of 1 per cent. HCl solution in distilled water. The acid increases the solubility of the salts and soaps of the feces. I usually employ about 100 c.c. of this solution at the beginning of the washing. The feces are thoroughly mixed with the wash solution and then centrifugalized. The use of the water motor or electric centrifuge is almost essential. Each tube is centrifugalized for about one and one-half minutes, then the cloudy supernatant liquid is poured through a layer of gauze. This fluid contains the bacteria in suspension. All of the mixture (the wash water and the feces) is centrifugalized the same way and then the residue in the tubes is shaken up with more of the wash water and centrifugalized again. This is repeated until the supernatant liquid after the centrifugalizing is transparent, showing that approximately all the bacteria has been washed out. If a smear is made of the residue at this point it will be found that the bacteria are not entirely washed away, but are evidently very much reduced. They occur singly, while in the unwashed feces they are in great lumps and masses. I do not believe that it is practicable or even possible to wash the feces entirely free of micro-organisms.

Strasburger recommends that the wash water be centrifugalized for a short time at high speed in order to remove any stray particles of solid residue from the suspension of bacteria. I believe this is a mistake, for if the decanting is carefully done in the first instance then, in my experience, the sediment obtained with the second centrifugalizing is composed almost wholly of bacteria which would be lost if this part of the procedure was always carried out. The suspension of bacteria is then mixed with a liberal portion of alcohol and evaporated down slowly at a temperature of 40 to 50 C. until it amounts to not more than 50 c.c. in all. This takes approximately twenty-four hours. It is then mixed with at least twice its volume of alcohol, preferably absolute alcohol, although this is not absolutely necessary. This lowers the specific gravity of the fluid to such an extent that now the bacteria readily contrifugalize out.

The mixture is then centrifugalized until the supernatant liquid is quite clear. This make thirty minutes or more for each tube. The residue, which consists of the bacteria, is washed with pure alcohol and is shaken up with ether to remove the fat; then it is again washed with alcohol. All of this washing is done by means of the centrifuge. The bacteria are next washed out of the tube with a little alcohol and evaporated to dryness and dried in the oven at moderate heat, dried in the desiccator and weighed. Smears of the final preparation show that it consists of bacteria with a very few minute particles of other material. These particles are only visible with high power and are very few in number, perhaps two to each field of the 1/12 objective. They stain with methylene blue, and Strasburger suggests that they are cellulose, which they may well be. At any rate, the error arising from the inclusion of these small particles in the dried weight of the bacteria must be very small and is probably balanced by the bacteria that it is not possible to wash out of the residue in the first washing. During the preparation of the bacteria the first portion of 5 c.c. has been dried and weighed. We then know the dried weight of 5 c.c., the weight of the dried bacteria in 5 c.c., the original volume of the stool and the volume after the addition of a known amount of water. It is then easy to calculate the data that we desire, namely, the volume of the stool, its dried weight, the weight of the dried bacteria and the percentage of bacteria in the dried weight.

DISCUSSION.

DR. MARY GAGE-DAY, Kingston-on-Hudson, N. Y., asked concerning Dr. Steele's experiments with intestinal antiseptics, which antiseptics increased the bacteria. She said that, since one is apt to give antiseptics to check fermentation, it is a practical point to avoid those which Dr. Steele found to increase the bacteria.

DR. J. DUTTON STEELE, Philadelphia, said that the question of intestinal antiseptics is confusing, because no systematic work has been done on it. In all the medical literature on the work that has been done with these antiseptics, using either this method or counting, Dr. Steele said that he found only two antiseptics mentioned as apparently decreasing the bacteria, and they are salicylic acid and bismuth salicylate. Given to normal people they caused a decided diminution of the fecal bacteria. In one of Dr. Steele's cases in which he gave betanaphthol, the bacteria were found to be doubled, and that is in accord with the results obtained by men working in Germany, particularly, who gave intestinal antiseptics.

Pityriasis Rosea.—Aronstam, in the *Medical Fortnightly*, states that this disease resembles intimately ringworm of the body, presenting, however, larger crescentric and circinate lesions than ringworm. The macules look yellow, do not exhibit an inflammatory zone nor vesiculation at the margin; they are but slightly scaly, and as a rule invade the trunk in preference. They are non-parasitic and disappear under indifferent medication within about two weeks.

DIFFUSE CARCINOMA OF THE STOMACH, ESOPHAGUS AND DUODENUM.*

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The most common form of carcinoma of the stomach is the one presenting a more or less sharply demarcated tumor near the pylorus. Less frequently there is simply a diffuse thickening of the stomach wall with not very sharply defined margins. Occasionally the latter type involves almost the entire extent of the stomach, causing a diffuse thickening of the stomach wall. The former type usually has an ulcerated surface; in the latter often the mucosa remains intact. When there is a very extensive involvement of the stomach in a diffuse growth the term "leather bottle stomach" has been applied, and it is not an inapt descriptive term. Such cases are uncommon, and it seems worth while to place another on record, especially since in this case a large extent of both esophagus and duodenum in addition to almost the entire stomach were involved.

Patient.—L. K., aged 62, was admitted Jan. 23, 1906, to the Massachusetts General Hospital, in the service of Dr. R. H. Fitz, by whose permission I report the case.

History.—Family and past history negative in so far as concerns the present trouble. Habits good, neither tobacco nor alcohol indulged in.

History of Illness.—For the past three months the patient had had what he termed "stomach trouble," with a full feeling after eating small amounts. For two months he had had pain in the epigastric region. At first there were eructations of gas, now very slight. There has been no nausea, but food regurgitated easily for a time after each meal. This latter condition became less marked. The pain continued and grew worse. Vomiting occurred frequently from five minutes to one-half hour after eating. Vomitus was not large in amount and had not been observed to contain food eaten the day before. There had been no evidence of blood in the vomitus. Appetite poor; patient said he thought he vomited from one-third to one-half of what he ate. Bowels constipated since onset of present illness. Dejecta formed, firm, not ribbon like. For two weeks he had been short of breath and feet and legs had been swollen. He had passed but little urine for ten days. He drank little water, however. He urinated two or three times at night. For six or seven years he had had bleeding piles. The patient thinks that he has lost much weight and grown very weak during past three months.

Physical Examination.—A large framed, emaciated man with skin dry and slightly rough, mucous membranes slightly pale, pupils normal, tongue moist and clean, throat negative, heart not enlarged, no murmurs, radial and brachial arteries thickened but not beaded. Pulses synchronous, regular, slow, good volume, fair tension and regular size; veins of arms and chest visible and prominent. Lungs: no dulness, few medium moist râles in both lower backs. Abdomen full and moderately distended, with a few bluish distended veins extending upward on the chest wall. Flatness in the flanks and in the lower portion of the abdomen up to within two inches of the umbilicus, shifting on turning from side to side, and with a slight fluid wave. Moderate tenderness in the epigastrium, especially just below the ensiform and also in both hypochondria, but more in the right. No palpable masses. Circumference of abdomen at umbilicus, thirty-three inches. Liver flatness beginning at sixth rib and extending to costal margin; edge not palpable. Splenic dulness 2x3½ inches, edge not palpable. Kidneys not palpable. A few pea and bean sized glands in groins, axillæ and neck. Moderate edema of ankles and legs up to knees. Urine: slightest possible trace of albumin with an occasional epithelial cell and rare hyaline cast.

Larage and Test Meal.—Stomach tube was passed down for fourteen inches, where it met an obstruction and could be passed no further. A large catheter was then used, which passed the obstruction and about one ounce of yellowish liquid was removed. There were no signs of blood. An Ewald test meal was given and after one hour removed by means of the catheter. The stomach could hold nineteen ounces of water, of which fifteen ounces could be recovered. Inflation showed the lower border to lie two and one-half inches above the umbilicus. The residue from test meal showed no free hydrochloric acid with Congo red or Töpfer's solution. There was a weak reaction for lactic acid. The guaiac test for blood was negative. Total acidity was 0.2 per cent. Stool showed no blood by the guaiac test and was otherwise negative.

Course of Disease.—January 30, an increase in abdominal fluid was noted. Swallowing was difficult and only liquids and soft toast were taken. Patient vomited occasionally, but the vomitus was not bloody.

February 3, abdominal circumference thirty-five and one-half inches. Much discomfort, especially at night. Patient continued to grow weaker until he died February 10.

Autopsy (M. G. H., No. 1596).—Examination of body 18½ hours later, by Dr. Oscar Richardson, showed a well developed, emaciated old man. The peritoneal cavity was filled with thin brownish red fluid, but the peritoneum was smooth and glistening. The anterior margin of the right lobe of the liver lay 3 finger breadths below the costal margin in the right mamillary line. The right pleural cavity contained a slight amount, the left a considerable amount of brownish red fluid. The peribronchial lymph nodes were enlarged and on section showed here and there rather large areas of grayish yellow homogeneous tissue. Lungs, pericardium, heart and liver were not abnormal. The gall bladder, which was free from stones, was distended and was slightly distorted by adhesions about it, which bound it to the intestine. The common bile duct was free, but just above where it extended along the wall of the duodenum it was slightly dilated and where it coursed along the pancreas and in the wall of the thickened duodenum it was slightly narrowed. Pancreas, spleen, adrenals, kidneys, bladder, prostate, seminal vesicles and testes appeared normal.

The wall of the esophagus, beginning at a point about at the level of the bifurcation of the trachea, was moderately thickened along its course down to the stomach. The wall of the stomach was thickened and measured at the pyloric end, where it was thickest, about 1.5 cm. The wall of the duodenum for a distance of 4 or 5 cm. was similarly thickened. The stomach as a whole was thickened, and the thickening was diffuse in character, although a small portion (about size of end of thumb) of the cardia to the left of the esophageal orifice was of about normal thickness and character. On section the increase in the thickness of the wall of the esophagus, stomach and duodenum seemed to be principally in the region of the submucosa, where the tissue was homogeneous, firm, gray-white in color. The mucosa of the stomach in several places was slightly thickened and rounded up over the thickened submucosa.

The retroperitoneal lymph nodes along the aorta and pancreas were enlarged and on section their tissue was firm, grayish and homogeneous. The peritoneum along the lesser curvature showed grayish, thin, plaquelike areas. Cultures from heart showed *Streptococcus pyogenes*, from the liver *Streptococcus, Staphylococcus aureus* and *Bacillus coli*.

Anatomic Diagnosis.—Carcinoma of stomach with extension into the esophagus and into the duodenum; metastases in retroperitoneal and bronchial lymph nodes and in lung (microscopic); chronic pericholecystitis; ascites; hydrothorax; slight arteriosclerosis; streptococcus septicemia.

Microscopic Examination.—Portions of the esophagus, stomach and duodenum show a diffuse infiltration with cancer. All portions of the wall of these viscera are involved, but in general the submucosa shows the greatest degree of thickening. The tumor is in the form of scattered epithelial cells, here and there gathered in small masses and these are separated by a fair amount of rather edematous stroma. In the muscularis there are scattered cells as well as small cell

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groups both within the muscle bundles and in the intervening connective tissue. The individual cells are of medium size and irregular shape. The nuclei are round, oval or of irregular shape, vesicular with finely divided chromatin and often a distinctly acidophilic rounded nucleolus. Mitotic figures are fairly frequent. Here and there is an occasional larger mass of epithelial cells, but these as a rule show no glandular arrangement. Rarely there is a distinct cell grouping, however, in form of tubular glands. The mucosa seems quite intact so far as tumor growth is concerned.

Sections from several lymph nodes show infiltration with the same type of epithelial cells. In one there are large cell masses and here the cells are more or less fused together so that cell outlines are indistinct. The general impression here, however, is that the cells tend to a flattened type. Still in the masses are fairly definite gland spaces, and in other lymph nodes is found a definite tubular type of atypical glands. The tumor for the most part is of the diffuse infiltrating type and only here and there suggests an origin from the squamous epithelium of the esophagus. A stomach origin with extension to esophagus and duodenum seems more probable in this case in consideration of macroscopic and microscopic appearances. A section of lung shows minute metastases, chiefly in the perivascular lymphatics. Here in many places the tumor is distinctly of tubular gland type.

In a careful search of the literature I have been unable to find a case with such extensive involvement of stomach, esophagus, and duodenum with diffuse carcinoma as occurred in this case. Extensive carcinoma of the stomach, however, is not very uncommon. In 791 collected cases, Welch[1] found that 61 (4.7 per cent.) involved the whole or greater part of the stomach. The nodular, ulcerating type of carcinoma, however, which may be very large and infiltrate much of the stomach wall, is to be distinguished from the diffusely infiltrating type which causes a very uniform thickening of the stomach wall with little or no ulceration of the mucous membrane and Welch's figures include both types. The latter type constitutes a distinct group of tumors of the stomach and they are not very common. At the Boston City Hospital in 27 autopsied cases of gastric carcinoma there have been none, and in fifty-six autopsied cases of the same condition at the Massachusetts General Hospital two cases of such diffuse carcinoma. Of the latter one case is the one reported above. The other (M. G. H., No. 531) occurred in a man, 44 years old. The stomach in this case was small; its wall generally thickened. The mucous membrane showed no ulceration. Microscopic examination showed in the submucosa and muscularis scattered epithelial cells, singly and in small groups.

Welch[2] has reported one case in which the stomach was shrunken to the size and shape of a kidney, with thickening of all coats and without ulceration of the mucosa. A second case reported by him was similar, though the primary growth was in the ovaries.

Hektoen[3] described two cases, one very typical of this group, with no ulceration of the mucosa, the other with an ulcerated mucosa and perhaps not quite so typical, but still belonging to this group.

Perry and Shaw[4] have collected all of the cases of cancer of the stomach, primary or secondary, autopsied at Guy's Hospital from 1826 to 1900. Among these have been included some few cases of sarcoma and the total number of cases is 306. Of these fifteen were diffuse carcinomata involving the entire, or almost the entire, stomach. Of these, Cases 17 and 297, probably also Case 194, showed diffuse carcinoma of the stomach with extension into the esophagus. However, there was no extension into the duodenum in either of these cases.

Graves[5] and Cadd[6] each report one typical case belonging to this group. Doubtless other cases have been reported, but the reports are not easily accessible. Among the older writers undoubtedly some of the cases diagnosed fibrosis of the stomach were in reality cases of diffuse carcinoma without ulceration. In most of the reported cases the stomach was very greatly shrunken as well as thickened. Marked shrinkage, however, had not occurred in the case reported here by me.

1. Pepper's System of Medicine, ii, 561. 1885.
2. Johns Hopkins Hosp. Bull., 1893, iv, 98.
3. THE JOURNAL A. M. A., 1898, xxx, 1384.
4. Guy's Hospital Reports, 1904, lviii, 121.
5. Practitioner, 1905, lxxv, 172.
6. Brit. Med. Jour., 1906, i, 1343.

DISCUSSION.

DR. ARTHUR D. HIRSCHFELDER, Baltimore, asked Dr. Christian whether or not in this case there was the usual anacidity of the stomach, and if there were any disturbances in the pancreatic secretion. He also asked if there was imperfect meat digestion or absence of secretion or any evidence of results of it.

DR. HENRY A. CHRISTIAN, Boston, stated that the case showed the usual picture of cancer of the stomach, with reduced acidity. There was nothing especial in connection with the pancreas. The tumor did not extend down far enough to block the duct from the pancreas. The stools were examined, but did not show anything to suggest pancreatic disturbance, and there was no histologic evidence in the pancreas to suggest any such disturbance. There was some acidity of the stomach, but no free hydrochloric acid. In other words, the case was clinically like any other case of cancer of the stomach, except for the absence of a palpable tumor. The most prominent feature was the moderate degree of obstruction of the esophagus by the upper portion of the tumor.

THE DIAGNOSIS OF KIDNEY INSUFFICIENCY AND THE TREATMENT OF UREMIA.*

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I do not believe that uremia is caused by diseased kidneys alone, but that it is largely due to disturbances of the liver. The liver makes bile and glycogen, and stores the latter and iron. It also makes urea out of ammonium salts, which probably reach the liver in combination with sarcolactic acid or as lactate of ammonium. Extirpation of the liver in animals almost entirely prevents the formation of urea, which excretion is replaced by the ammonium salts and perhaps by leucin and tyrosin, and death soon occurs, generally preceded by convulsions. The liver has a controlling action on toxins, alkaloids and strong drugs, and it is this organ that allows a larger dose of a drug to be tolerated by the stomach than when given hypodermatically. In other words, the liver is our Pasteur filter, and the blood leaves it standardized. If any disease or condition interferes with liver function the system is poisoned by its inability to care for the waste products of its own metabolism, urea is diminished, and ammonium carbamate remains in the blood. The liver cells prepare the decomposition metabolic products for kidney excretion, and if they do not prepare them perfectly, the kidneys are irritated and disturbed by their effort to excrete substances that are not chemically perfect for such excretion. Hence malfunction of the liver will sooner or later cause irritation, chronic inflammation, and pathologic kidneys.

* Read at the Annual Meeting of the Connecticut Medical Society, at Hartford, May 22-23, 1907.

The amount of kidney excretion depends largely on the blood pressure. Anything that causes a general contraction of the blood vessels, provided the renal arteries are not constricted, will increase the flow of urine, while if the blood pressure becomes very low, as in conditions of cardiac failure or shock, there may be no excretion at all. Chemical changes in the blood plasma also modify the amount of urine excreted. Urea, dextrose, sodium chlorid, and various salts are diuretic because they increase the specific gravity of the plasma and the blood then seeks water from the tissues or from the gastrointestinal tract, and this increased amount of water in the blood soon causes diuresis. Caffein is a diuretic because it soon dilates the blood vessels of the kidney, while digitalis is a diuretic in cardiac debility.

The flattened epithelial cells lining the capsules of the glomeruli or Malpighian bodies take water and salts from the blood and pass them into the beginning of the urinary tubules. The activity of these cells seems to depend on the activity of the circulation through the capillaries of the Malpighian bodies, though they may be stimulated by some drug, such as caffein. Sugar and albumin are also probably excreted through the glomeruli. The rodded cells in the convoluted tubules excrete urea, uric acid, creatinin, and certain salts such as sodium chlorid, sulphates and phosphates, and with these enough water to keep the salts in solution. A change in blood pressure or anything that upsets the equilibrium of the circulation, whether functional or organic, climatic or nervous, will change the circulation in the kidneys sufficiently to modify the urinary excretion.

It is stated that the microscope will show a marked difference in some of the epithelial cells in the glandular portion of the kidney when these cells are in activity or at rest. These cells in activity show granules or grains of segregation (Renaut), and these aid chemically in picking toxins or salts out of the blood and excreting them into the urinary tubules. This would seem to be an internal secretion, so to speak, and preparations from these active glandular portions of the kidneys have been fed to patients whose kidneys are defective.

According to our present knowledge the glomeruli and the convoluted tubule represent the glandular portions of the kidney and each tubule may have alternating periods of activity and rest, while the other tubes of the kidney are probably excretory ducts. It is quite probable that if for any reason the excretion or secretion from the glomeruli is abnormal, the secretion or excretion from the convoluted tubules below will also be disturbed. If they are disturbed the first defect noticed is a diminished excretion of urea, while much disturbance of the glomeruli will allow a leakage of albumin.

According to Atwater, a normal adult at rest excretes in twenty-four hours, about a quart of water in the urine, about a quart by the lungs, about a pint by the skin, and about a half pint with the feces; i. e., a total of five and one-half pints of water. If no water is ingested, the blood plasma soon has its specific gravity greatly increased, and in spite of taking what water it can from the tissues, its ability to act as a solvent to carry and to aid in the excretion of salts is greatly diminished. If water is not ingested and foods poor in water, especially proteids and nucleins, are taken, their oxidation to urea and uric acid makes the thirst of the blood for water greater and the ability of the blood to carry nutrition and excrete waste products still less. Hence a certain amount of water is absolutely necessary for proper excretion. On the other hand, if more water is ingested than can be excreted, the vessels become distended with blood of low specific gravity, and the heart labors to circulate this increased abnormal amount of fluid. If the heart and kidneys are competent, unless there is sufficient exertion to cause profuse sweating, the extra amount of water will soon be excreted by the kidneys. If the heart is debilitated or the kidneys insufficient, edema and dropsy will occur. Also in this hydremic condition of the blood the nutrition of the cells is interfered with, as water is not absorbed from the stomach and intestines as it should be and therefore the nutriment is not properly digested nor properly absorbed and circulated.

Therapeutic conclusions are easy to draw, viz., that when the urine is diminished in amount and of high specific gravity, and the circulation is perfect, and the kidneys not badly defective, and there are no edemas, more water should be ingested. On the other hand, in conditions of weakened circulation where there are edemas and where there is serious kidney insufficiency, but little water should be ingested, and, for a short period, perhaps, very little. When the skin is dry and the surface tissues seem to shrivel, though large amounts of urine are passed by the kidneys, with the circulation good, and without edemas, water should be allowed in large amounts.

It is, then, wrong to push water ingestion in cardiac weakness; it is wrong to push water in serious kidney defect; it is wrong to withhold water in diabetes; and the amount of water allowed in gout depends on the condition of the heart and kidneys. Water should generally be given freely in high temperatures unless there are edemas, as it helps to excrete the toxins caused by the disease. After chloroform and ether anesthesia, especially if they have been prolonged, a high colon injection of physiologic saline solution should be given. This supplies water to the blood that has through perspiration or otherwise had its water reduced. It also acts as a diuretic and tends to prevent albuminuria from renal congestion due to the anesthetic. In acute nephritis water should be allowed in small amounts only, as it is badly excreted. In chronic nephritis with high blood pressure large amounts of water can do nothing but increase the blood pressure and put more strain on the cardiac muscle. The same is true in arteriosclerosis. All of this is equally true of large amounts of milk or any other liquid.

Acute nephritis and chronic parenchymatous nephritis give so many evidences of their presence that the diagnosis is unmistakable. Chronic interstitial nephritis, however, begins so insidiously that we should try and foretell its probable development. Cardiac lesions which cause more or less passive congestion of the abdominal organs tend to cause nephritis, and the same is true of liver disturbance. We should take note of long continued intestinal indigestion which allows irritants to reach the kidneys as indicated by the appearance of indican in the urine, and these continued irritants of the kidneys can later cause chronic nephritis.

A little higher blood pressure, a little increased nervous irritability and more frequent urination, with a total increased amount of urine of a low specific gravity are signals of warning. Soon the urine shows an occasional hyaline cast, then an intermittent trace of albumin, and the kidney irritation becomes positive. With this intestinal indigestion more toxins are pro-

duced, and, reaching the liver, interfere with its perfect metabolism. Less urea is formed and more uric acid and ammonium salts, and more ammonium carbamate is left in the blood, all to the disadvantage of the kidneys. If with these signs there are some joint disturbances, with or without chronic endarteritis, and later arteriosclerosis, the condition called gouty is present and the kidney resulting is the gouty kidney.

If the above set of signs and symptoms are allowed to persist, chronic nephritis will almost surely develop, and even if on repeated examinations of the urine albumin and casts are not found, we still do not know that the kidneys are perfect organs. The twenty-four hours' urine must several times be collected and examined as to the ability of the kidneys to excrete the various salts, and the results of these examinations associated with the condition of the circulation, skin, and digestive system may decide whether or not chronic interstitial nephritis is present.

It must be positively stated that the absence of albumin and casts from the urine in such cases is not a proof that interstitial nephritis is not present. An estimate of the nitrogen excreted in the urine in twenty-four hours seems to be the surest indicator of the kidneys' ability to functionate. If small amounts of urea and large amounts of ammonium compounds are excreted in the urine, i. e., the reverse of normal, the liver is at fault. If there is much indican and the sulphates are increased in the urine, there is intestinal disturbance and substances are getting into the blood which will sooner or later cause liver and kidney disease.

If the phosphates are much increased, especially in urine passed hours after a meal, there is probably a good deal of nervous and cerebral disturbance, while in nephritis the phosphates are generally diminished. If the chlorids are greatly diminished as they are likely to be in nephritis there will probably be edema. After several such examinations of the twenty-four hours' urine have been made, while the patient is on a general mixed diet, it can be determined which article or class of foods, or particular salts he does not readily excrete, and such can be removed from his diet. Such examinations will also show what drugs he should not take.

With proper dietetic and hygienic care chronic interstitial nephritis may be postponed, and kidneys defective in parts, with the urine showing albumin and casts, can recuperate. As the whole kidney is often not symmetrically diseased, healthy portions of it can hypertrophy and do perfect work, while the diseased portions of the kidney either recuperate or atrophy and cease to pass abnormal urine. There is no known limit to the ability of the kidneys to regenerate. Hence a prognosis from the urine findings alone is difficult to make.

We now recognize that a little albumin may occur in the urine without any pathologic cause. Severe muscular exercise, beginnings of acute infections, severe mental disturbance, temporary debility of the circulation, menstruation, skin irritations, severe chilling and cold baths may all allow albumin to appear in the urine without any kidney defect whatever.

It should not be forgotten that inflammation of the prostate will cause albumin to appear in the urine, and in chronic prostatitis this albumin may be constant.

Persistent renal albuminuria, however, probably indicates nephritis except in the rare cases of orthostatic albuminuria. It must also be acknowledged that frequently recurring renal irritation sufficient to cause renal albuminuria probably leads sooner or later to chronic nephritis. Tube casts can be present without albumin, but it is often the trace of albumin that starts the hunt for tube casts.

I think that we may declare that a trace of albumin in the urine, in spite of the above exceptions, is never good physiology; that the term physiologic albuminuria is not a good one; that small amounts of albumin or even traces in the urine show kidney weakness or kidney irritation. Kidney weakness, then, should be protected by the kind of diet and life that will use the kidneys the least strenuously; if kidney irritation, by such mental, physical and physiologic rest as to remove the condition. In other words, an individual having such an albuminuria needs a proper diet and rest cure until he is over it, as continued irritation means future nephritis.

Centrifuged urines will often show hyaline and sometimes granular casts in normal individuals with normal kidneys, and certainly to centrifuge a previously sedimental urine is unfair to the individual from the insurance standpoint.

Many of the same causes that produce transient albuminuria can cause casts to appear in the urine, as passive congestions, severe exercise, athletic tests, chillings, irritations from alcohol and drugs. The cause being stopped, casts in such cases rapidly disappear.

Hyaline casts can occur during acute infection, in any bowel intoxication, in jaundice, and after anesthesia, and can easily occur from any simple irritation after forty years of age. Though traces of albumin probably exude at the same time from the same conditions which cause these casts to form, it may not be sufficient to show in the urine. Persistent casts, however, even if only hyaline and even without albumin, are indicative of interstitial nephritis, though the disease may not be progressive.

We must conclude that our ability to diagnose the condition of the kidneys or prognose the future does not rest on the finding of albumin and casts in the urine. Serious nephritis may be present and repeated examinations show no casts and no albumin, although at any examination, a series having previously been negative, large amounts of albumin and all kinds of casts may suddenly appear without apparent cause. I have personally seen many cases bear out this statement. On the other hand, it is only persistent albuminurias and persistent finding of casts that show there is nephritis. Intermittent findings or occasional findings may show only kidney irritation. With continuous finding of albumin and casts the actual condition of the kidneys can only be determined by the associated symptoms, viz., by a diminished output of salts, a greatly diminished or greatly increased bulk of the urine, the latter with low specific gravity, indigestions, headaches, circulatory disturbances, and eye symptoms.

According to Croftan[1] when urea disappears from the urine in uremia it also disappears from the blood, while ammonium salts are increased. This carries us back to the liver where urea is produced. When urea is injected into the blood experimentally it does not cause coma, but ammonium salts do. When in a nephritis case uremia is imminent, as especially shown by the urea-nitrogen of the urine being greatly decreased and the ammonia-nitrogen being greatly increased, our attention should be turned to the liver and not to the kidneys, and it may be the relief of the liver by saline purgatives that improves uremic conditions. We recog-

1. THE JOURNAL A. M. A., Jan. 6, 1906.

nize that it is often dangerous to administer morphin to a nephritic patient, and yet a large amount of this morphin is re-excreted into the stomach and never was or would be excreted by even healthy kidneys, so that the mere holding back of the morphin by the kidneys is not the whole reason for its intense action. On the other hand, we know that in liver malfunction morphin is badly tolerated.

The high arterial tension of nephritis, and especially of uremia, is doubtless due to the toxins in the blood causing sufficient irritation to make the blood vessels contract. Many of these irritants are reabsorbed from the intestine in conditions of fermentation and putrefaction, one more reason for the proper cleansing of the bowel with catharties and the prevention of further fermentation by a restricted diet. When constipation or maldigestion is in evidence in kidney disease the liver quickly is more and more disturbed and its ability to produce urea is decreased, the ammonium salts increase, and uremic symptoms are the result. Also, in this sluggish condition the bile is not properly liquid and more or less bilious congestion takes place. There are headaches from the bile irritation of the brain, the sclerotics and skin become yellowish, and the skin, endeavoring to excrete irritants from the blood due to the insufficiency of both liver and kidneys, becomes irritated, itches and may show urticarial disturbance. From the scratching, eczematous conditions occur, and if insufficient baths are taken and no massage is done the skin becomes dry and can not do its normal excretory work, and more trouble and irritation is thrown on the kidneys, and uremia is soon the outcome.

The length of time, in uremia, that the diet should be nothing but water, and hot baths should be taken, and saline purges given, depends entirely on whether the symptoms become better or not; it may be twenty-four hours, it may be forty-eight; but if no improvement occurs in two days, the case is probably hopeless. If there is improvement the diet should be such that there is a minimum amount of uric acid formed and a minimum amount of urea, and again we are aiming at the liver function. Intestinal fermentation may be prevented by the administration of sodium glycocholate in half-gram doses, and perhaps no bowel antiseptic is safer, considering the kidney defect.

Cardiac tonics are rarely indicated when uremia is pending or present. On the other hand, vasodilators, as nitroglycerin, are often of great value. Too great lowering of the blood pressure, however, in the chronic interstitial nephritis of old age should not be attempted, and would be pernicious if continued. The liquids and sodium chlorid given should depend entirely on the character of the circulation and whether or not there are edemas.

Whether or not there is an internal secretion of the kidneys, I have certainly seen life prolonged in nephritis by feeding fresh kidneys. I have not had much results from the nephritin tablets. Thyroid extract certainly aids in preventing convulsions in uremia, and is, I believe, the most efficient preventive of that symptom.

If there is severe pain, especially in the cardiac region, morphin must be administered though theoretically contraindicated. If there is coma and other symptoms of cerebral pressure, spinal puncture may relieve them, but is rarely of any avail.

If we have positively seen a case of chronic nephritis progress gradually from bad to worse, I do not believe it justifiable to use superhuman efforts to prolong life for a day or two. On the other hand, in uremia, when we are in doubt as to how far the pathology has proceeded, and in acute nephritis, we should do venesection in amount sufficient to decidedly lower the blood pressure. If the patient is debilitated and anemic, this venesection may be immediately followed by a small saline transfusion.

In acute nephritis, and when uremia is pending in chronic nephritis, and during uremia, high colon washings with physiologic saline solution should be done several times a day, and as hot as can comfortably be borne. The temperature may be 110 F., with a continuous return flow. A rectal tube can be passed a short distance, and with the hips elevated the water will flow readily into the colon. This hot colon douche will often relieve kidney congestion. If there is no edema, some of this solution should be left in the colon, and is one of the most efficient diuretics.

We may sum up the treatment of uremia as absolute muscle rest; the withholding of all food, not even giving milk; administering very little water by the mouth even if there is no edema, as the ability of the kidneys to excrete water, even, is often abolished; frequent colon irrigations of hot water, leaving some in the colon for absorption if the blood pressure is low and there is no edema; the administration of thyroid; hot sponging of the skin; venesection in most cases, repeated if necessary, as it has been shown that an ounce of blood will remove more toxins than eight or nine times that of fluid feces or than quarts of perspiration; and the administration of nitroglycerin if the pulse tension is high. If the uremic period is passed and the kidneys again begin to secrete and excrete, the diet and life of the patient becomes of primary importance, but that is not the object of this paper to discuss.

THE PHYSICIAN AND THE NEWSPAPER.

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There has always been a wide difference of opinion between physicians and newspaper men as to the propriety of advertising. There has been occasional newspaper comment relative to the much talked of, but little understood, Principles of Ethics. It has been assumed that it militates against the advertising function of the newspaper because one of its principles states that: "It is incompatible with honorable standing in the profession to resort to public advertisement or private cards inviting the attention of persons affected with particular diseases; to promise radical cures; to publish cases or operations in the daily prints, or to suffer such publications to be made; to invite laymen (other than relatives who may desire to be at hand) to be present at operations; to boast of cures and remedies; to adduce certificates of skill and success, or to employ any of the other methods of charlatans." The true physician has nothing to advertise except that which is found in the simple card which announces his presence and location in the community.

Physicians are the guardians of the health and physical welfare of the people; newspapers are the molders and often the creators of public opinion. The medical profession, personally, and the newspaper fraternity, through the press, come into closer touch with the community than any other profession or calling. No other two societies of men have so keen an understanding of

human nature and its desires, passions, virtues, weaknesses and faults. The relations of the physician and the newspaper to the public embody great reciprocal obligations and rights.

Recently the press has been giving its attention to "graft," which, in all of its ramifications in the business and political fields, does not equal the graft that has resulted from the advertising of nostrums and quacks. Worse than graft are the wreck and ruin that are traceable to certain classes of advertisements, for an estimate of which one would have to journey through all the eleemosynary institutions of the land, making diligent inquiry as he traveled, listening to the story of the inebriate and dope fiend and their progeny. He would have to learn from the brothel the story of mistakes corrected by crime advertised for sale between the lines of crafty advertisements; but he would have to wait until Gabriel blows his trumpet for the heart-rending tale of the innocents—and their name is legion—whose lives were sacrificed in the dim gray dawn of their early existence. He would have to learn from the physician the amount of suffering, the number of surgical operations, blind eyes and other deformities, directly and indirectly traceable to advertisers who have failed to make good their guarantee to cure certain diseases in from ten to thirty days—a guarantee which every conscientious physician knows to be impossible of fulfilment.

Can not the press be made to realize that it is the ally of fraud and deceit when used as the mouth-piece of the get-rich-quick concerns that guarantee to cure the entire list of human diseases with some mysterious decoction of roots and herbs?

How long will the American press, with a few notable exceptions, continue to contribute inches to the campaign against the great white plague and sell columns to the men who talk about that "hacking cough" and promise to cure consumption with some wonderful new discovery?

The fraud of these advertisements is concealed in their seductive language, which appeals to a credulous and suffering people; when read by the side of news items and high-class, legitimate advertising and in connection with the editorial comment that sustains governments and so often determines their policies, the claims of the advertisers become truths to many because they are substantiated and verified by the very fact of their appearance in the medium which sows them broadcast.

One wonders what the paragrapher's pen would write should he see in his paper an advertisement setting forth that "L. E. Gall, a graduate of the leading law schools of America and Europe, with ten years' experience in the supreme courts of both countries, is now prepared to look after the interests of all who may require his services. Special attention given to criminal and civil cases. He guarantees acquittal in all cases of murder, infanticide, grand and petit larceny, embezzlement, forgery, blackmail, libel and slander. Divorces secured in two weeks. No publicity. Suitable homes provided immediately after acquittal. He was never known to fail. None of the lawyers in ordinary practice has the facilities for handling these cases that he has. Call at once and be convinced. No charge for being convinced."

It has been said that all the quacks do not advertise. Just as there are "yellow journals" there are "yellow doctors," and for ways that are dark and tricks that are mean they are most peculiar. That each calling contains members with whose services society could well afford to dispense should be apparent to all. It may be confessed that physicians themselves have not been without blame in the matter of quackery, for had there been less quibbling between schools of practice, whose differences are now fast fading away, the way would not have been prepared for the endless string of charlatans who have found it easy to ingratiate themselves into the confidence of so many of the people.

Let medical men continue to guard the public health, but let them put away their petty jealousies and frivolous contentions that open the gaps through which pretenders enter to mystify and cajole some of the most intelligent. Let honorable physicians tear down the walls that separate them; let them enlist the newspapers in a righteous cause and be coadjutors in the emancipation of suffering humanity from a thraldom which has already enslaved too large a part of the human family.

Every one who reads current medical literature even cursorily must be impressed by the frequent demands for a "campaign of education as the only means of fighting the nostrum and kindred evils." There is eminent authority for the statement that "it is the duty of physicians, who are the witnesses of the enormities committed by quackery and the injury to health and even destruction of life caused by the use of quack medicines, to enlighten the public on these subjects, to expose the injuries sustained by the unwary from the devices and pretensions of artful empirics and impostors. As good citizens it is their duty to be ever vigilant for the welfare of the community and to give counsel to the public in relation to matters especially appertaining to their profession."

Living as we do in a nation of newspaper and magazine readers, are we discharging our duty to society when we fail to make use of these large and powerful educational institutions? If fraud can thrive and prosper with the press for its hotbed, can it be that truth can not be planted there, to flourish and grow until the former is blighted and killed by the inherent tendency of the latter to prevail?

Instead of being so very chary about newspapers might it not be advisable to use a little of their space for the education of the people—for the exposure of fraud and the teaching of the plain a, b, c's of health, free from technical phraseology—and thereby counteract, for the present, and ultimately wipe entirely out, the columns of rot with which so many papers are filled, setting forth the great efficiency of some nostrum? It is one of the crimes of the ages that any of the great discoveries made by men of science, who have labored unselfishly, without hope of reward, and given the fruits of their labors to humanity, should be prostituted, as they are, by mendacious charlatans. Witness the *x*-ray, with its great usefulness in a limited field of application and in the hands of those who are honest and sufficiently competent to make use of it, becoming the chief stock in trade of quacks. There is not sufficient capital on earth to enable these adroit, advertising frauds, these execrable advisers and mercenary monsters, to ply successfully their nefarious trade against a well-directed campaign of education. To be sure they will angle, possibly with new bait, but the fish will have learned to recognize the line from which dangles the hook with its dainty allurement.

The public should know that behind most of the cunning advertisements and reading notices are hidden fraud and deception, and that back of these are base pretenders, who trifle with life and disease, who prey on the

unfortunate and feed fat on bodily ills. It does not seem possible to remedy these evils through medical journals alone. The people must be reached. "The members of the medical profession, on whom has ever been enjoined the performance of so many important and arduous duties toward the community," will never have discharged their full duty until they have educated the people to that degree of intelligence in matters medical which shall convince them that they can receive with safety neither advice nor treatment from any other than the duly qualified and unpretentious sources where they are now wont to appeal after they have been bankrupted in health and bled to financial death by the conscienceless mountebanks into whose hands they have fallen.

Even the base pretenders themselves appeal at last to the medical profession for aid. Witness the spectacle of John Alexander Dowie, after having expended all the vigor of his powerful body in heaping abuse and vilification on the medical fraternity, appealing to the physician and beseeching him to hold his tottering old frame together while he endeavors to regain possession of his lost and ill-gotten gains to traduce anew his benefactors.

There is but one medium through which the people can be taught; it is the same medium that has furnished the instruction for present intolerable conditions; it is the greatest educational medium for the masses extant; it is the medium most eagerly sought and perused; it is the cheerful companion and indisputable criterion of almost every fireside—the newspaper.

How shall we make use of this medium? Certainly not by abusing it, for it has not been shown that even the great wisdom of the newspaper fraternity is sufficient to enable them to detect the cunning cupidity of some of their advertisers. Let the American Medical Association establish a Bureau of Education for the dissemination of such knowledge and advice as will enable the people of this country to act intelligently in matters pertaining to their own health and lives, thereby making it possible for them to assist the medical profession in their efforts to prevent disease, relieve suffering and prolong human life. Organized as this powerful association now is, this bureau would be in affiliation with each state and county society and there could be such a division and subdivision of the labor incident to the writing, editing and distributing of suitable articles for publication as would make a systematic campaign of education practicable. Organizations like the Austin Flint-Cedar Valley Society should also be affiliated with this bureau. Every decent newspaper in the United States would coöperate in this work by giving space in its columns to be filled with true information regarding health and everything affecting it. News of this kind would be of surprising and surpassing interest to readers. With the friendly aid rather than the opposition of the press more could be accomplished in a short time in the way of creating public sentiment in favor of certain reforms and in matters of legislation than can be accomplished by medical journals in the next twenty-five years.

As a result of public sentiment, created largely by the medical profession and the untrammelled press, the pure food bill has been enacted into law. In order that this law may become effective state laws must be made to conform with it. There is still work for the profession and the press. There is enough instructive, constructive and destructive educational ammunition stored up in THE JOURNAL arsenal of the American Medical Association, to say nothing of the other medical journal powder houses scattered over the country, soon to create public sentiment that will demand the needed state legislation if it be judiciously fired through the columns of the American press.

I will not be accused of anything worse, perhaps, than being a dreamer for expressing the belief that it is possible to carry on such a campaign of education as will result in public sentiment demanding what the physicians have so long striven for—a Department of Health with a representative in the Cabinet of this Government.

The *Ladies' Home Journal*, *Collier's Weekly* and a few other magazines and newspapers have recently taken a decided stand in opposition to the nostrum evil. Some papers have refused contracts for the most obnoxious advertisements. Editorially a few of the reputable newspapers are supporting the medical profession in its campaign against disease, food adulteration and quackery. To all of these who espouse our cause a vote of thanks is due from every medical organization on behalf of the American people, who will profit most by the press' championship for reform.

In this connection, and in view of courtesies extended by the medical profession to the ministry, the following item taken from a telegraphic report of the Presbyterian General Assembly for May 21, 1906, is of passing interest: "The 'quack medicine overture' was handled by the committee on bills and overtures, which recommended no action, as the church papers are private enterprises." Not even a resolution by a great body of righteous people condemning this most heinous thing. Pray tell us who "handled" the committee? And who "handled" the "handle" that "handles" the "private enterprise"?

The Chicago *Sunday Tribune*, in its issue of May 20, 1906, published a significant editorial with this caption: "The Preacher and the Newspaper." Quoting Bishop Fallows, it says: "The minister should use the newspaper as one of the most effective agents for assisting him in his chosen work." Are we better than the ministry, or are we worse, or what is the reason that we should entirely avoid the newspaper? By substituting physician for minister the rest of the article is apropos: "Modern society, with fast mails, telegraph, telephones and improved mechanical devices has developed the newspaper into a daily encyclopedia of information, illustration and inspiration which (should) prove one of the greatest aids in the general improvement of moral, social (and health) conditions toward which the physician ever strives. The individual physician makes his voice heard only by a limited number. The newspaper, with its agencies for the transmission of important items to all other journals of its class, makes its influence felt round the world. . . . It is easy to make a sweeping condemnation of the newspaper if one takes its records of sin and crime (and some advertisements) for a standard and talks of the effects of this publicity of human wickedness. It is easier to prove that the press has been a most powerful factor in bringing about the great reforms which have marked epochs of civilization. With the friendly assistance of the press he can make his effort for humanity far more effective and so do more for the cause of his Great Master."

Will the newspaper aid the medical profession in such a campaign of education in view of the probable financial loss it means to them? Let the question be answered by an extract from another editorial printed Jan. 23, 1906, in the same newspaper: "There are advertisers who labor under the belief that they can silence newspapers by drugging them with advertisements, or punish them,

when outspoken, by withdrawing what they call their 'patronage.' No newspaper worthy of the name will be influenced by advertising conferred on it or withheld from it. Attempted terrorism will simply make an independent newspaper more determined to pursue a course which it believes to be right. That is the policy *The Tribune* will insist on if it shall never print another line of . . . advertising from now until the crack of doom. When *The Tribune* sells space to advertisers it does not sell its convictions."

It will require more time than is at the disposal of the present generation for physicians to counteract the influence now exerted by quackery through the medium of the press, unless they adopt some other method than that of simply dropping a word of advice into a wavering patient's ear as he hurriedly passes through the office.

With the newspapers as the allies of the physicians the malady can be eradicated, root and branch, and the pen be again proved mightier than the sword. The education of the masses will remedy the evil, and the newspapers will "do more for the cause of their Great Master" and further establish their title to the claim of being "the great factors for shaping public opinion, advancing reforms and accomplishing results," when they no longer add to the already alarmingly large number of hapless human beings, which they have steadily, but in a great measure innocently increased; who are being tossed about on this merciless, mercenary sea of quackery from one wave to another—now on the summit of hope, soon in the trough of despair, pausing at each port of promise, only to weigh anchor and drift out on the boundless ocean of symptoms, anxiety and fear and on into the eternity of despondency.

THE OPERATION OF GASTRO-JEJUNOSTOMY AND ITS PHYSIOLOGIC EFFECTS.*

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When your distinguished President of last year conveyed to me a cordial invitation to be present at this meeting of the American Medical Association, I accepted at once, thinking of the opportunity which I should have of seeing for myself and profiting from the work of the many in your country whose fame has spread across the sea. When I came to seek for a subject on which to address you, however, I realized the rashness of my ready compliance. So much work has been done here on that branch of surgery in which I am especially interested that I felt that, were I to dwell on any purely surgical aspect of gastric disease, I should be going over ground already familiar to you, and so should be trespassing too far on that indulgence and leniency which I have heard you so invariably extend to those who are your guests.

In my Hunterian lectures,[1] delivered before the Royal College of Surgeons last year, I gave the results of some investigations into the effect of the operation of gastro-jejunostomy on the metabolism of the human body. After some consideration I determined to pursue those investigations further and to lay the results before this meeting.

When, as was the case but a few years back, the operaton of gastro-jejunostomy was performed only as a last resort in cases of pyloric stenosis, physiologic questions were a secondary consideration, but at the present time, when the operation is frequently advised for conditions such as intractable gastric ulcer, in which it is an operation of expediency rather than of necessity, a knowledge of its precise effects on the gastric and metabolic functions of the body must be one of the determining factors in the decision for or against operation. It is on this aspect of gastro-jejunostomy that I purpose to offer some observations for your consideration.

THE EFFECT OF GASTRO-JEJUNOSTOMY ON THE FUNCTIONS OF THE STOMACH.

The Presence of Bile in the Stomach.—All observers are agreed that a certain amount of bile finds its way into the stomach after the operation of gastro-jejunostomy. It is said that the quantity is at first fairly abundant, but after a few weeks considerably less.

In my own experience it is rare to find bile in the fasting stomach, and I regard its presence under such conditions as evidence of inefficiency of the efferent opening. The fluid drawn off one hour after a test breakfast often appears to contain bile, but Gmelin's test usually gives a negative result. If the gastric contents be tested two hours after a test meal, Gmelin's test is frequently obtainable. I use the expression obtainable advisedly, for considerable care is often requisite to demonstrate the presence of bile, although from the appearance of the gastric contents one would judge that it is present in some quantity.

Indeed, I believe that the amount of bile which regurgitates into the stomach is considerably overestimated. Gmelin's test does not give a positive reaction unless bile be present to the extent of about 5 per cent., and the green color of the test is, as a rule, only just visible and sometimes can not be seen at all. It is probable, therefore, that the regurgitated bile forms not more than 5 or 6 per cent. of the stomach contents. I need hardly point out that if bile gains entrance into the stomach pancreatic secretion must do so as well.

Granted, then, that there is a permanent reflux of bile into the stomach after gastro-jejunostomy, the question arises, Is its presence harmful? All the evidence indicates that it is not, provided the efferent opening of the anastomosis is efficient. Dastre[2] and Masse[3] have shown that in dogs the presence of bile in the stomach does not interfere with the digestion and general health. The well-known case reported by Moynihan[4] as well as the results of the operation of cholecysto-gastrostomy in man, confirm these observations, while the metabolism experiments, to which I will refer later, afford further evidence to the same effect. Indeed, I think we may safely affirm that, in part at least, the beneficial effects of gastro-jejunostomy on gastric ulcer are due to the entrance of the alkaline pancreatic juice and bile into the stomach.

The Effect of Gastro-jejunostomy on the Gastric Secretion.—The most marked effect of gastro-jejunostomy is the diminution of the total acidity of the gastric contents which follows operation. At first sight it would appear that this diminution is but the result of partial neutralization of the gastric contents by the bile and pancreatic juice which gain entrance into the stomach. But the problem is not such a simple one.

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

1. Gastric Surgery, London, 1906.
2. Archives de Physiol., 1890, ii, 316.
3. Congres Francais de Chirurgie, 1898, 300.
4. The Work of the Digestive Glands.

Time will not permit me to describe in detail the observations which I have made on this interesting subject, so I will briefly indicate what appear to me to be the chief factors at work.

From an examination of a considerable number of cases I find that the average diminution of the total acidity after gastro-jejunostomy is about 35 per cent. There are several reasons which appear to me to indicate that this diminution is not due solely to partial neutralization.

First, judging by the amount of bile usually found in the stomach, the diminution is too great to be the result of a purely chemical reaction.

Second, if the diminution were the result of a chemical reaction we should expect all the free hydrochloric acid to be neutralized, but this is not invariably the case. In several cases I have found free hydrochloric acid present, and in those cases in which it has been present before operation it can usually be demonstrated after operation, by giving a suitable test meal, such as Leube's.

Third, there is a diminution of the total chlorids in the gastric contents which must be the result, not of neutralization, but of diminished secretion. Two factors at least, therefore, appear to be at work in bringing about the diminution of total acidity which is found after gastro-jejunostomy: 1, A diminution of the total chlorids secreted; 2, partial neutralization of the gastric contents by bile and pancreatic juice.

The brilliant researches of Pawlow[5] and his co-workers have demonstrated the striking interdependence of the secretions of the digestive glands, and it is this interdependence which seems to me to afford us a reasonable explanation of the diminution of chlorids. We may, I think, safely assume that during the churning movements of the stomach some of the gastric juice will be, as it were, squeezed through the anastomotic opening. This escape of some of the acid will prevent the total acidity rising as high as would otherwise be the case. But it will have a further effect. The presence of an acid fluid in the jejunum causes a secretion of pancreatic juice (Wertheimer).

Thus after gastro-jejunostomy, if my hypothesis be correct, the early presence of acid in the jejunum will lead to a flow of pancreatic juice at an earlier period of digestion than in a normal individual. With this earlier stimulation of the pancreas there will be a correspondingly earlier diminution of the gastric secretion, and, as a consequence of this, a diminution in the total chlorids secreted by the gastric mucous membrane. Possibly other factors are at work, such as an inhibitory effect of secretin or other constituent of the pancreatic juice. In those cases in which there has been hyperacidity before operation the removal of the abnormal excitation of the gastric mucosa, which results from spasmodic stenosis of the pylorus, will lead to a considerable diminution of the total chlorids, and it is certainly significant that it is just in these cases of gastric ulcer with hyperacidity that the diminution of the total acidity of the gastric contents is most marked.

The Effect of Gastro-jejunostomy on Gastric Digestion.—Some authorities maintain that gastric digestion is lost after gastro-jejunostomy. Even if this were true, it is not of such importance as would at first sight appear, for we know from the experiments of Pachon and Carvalho[6] on dogs, from the observations made on Schlatter's[7] celebrated case of total gastrectomy, as well as from the clinical evidence afforded by those patients who have survived complete removal of the stomach, that Nature is able to dispense with this organ. There is, perhaps, nothing more wonderful in the whole range of surgery than that human beings should not only survive the operation of total gastrectomy, but should remain for years in the enjoyment of perfect health and activity. I need hardly remind you that the first surgeon to conceive and carry out this daring project was one of your own countrymen.

Notwithstanding, however, Nature's adaptability, the retention of gastric digestion undoubtedly adds to the resisting power of the individual in the struggle for existence. Personally, I do not believe that loss of gastric digestion is a necessary consequence of a short circuit between the stomach and jejunum. Those who have expressed an opposite view base their conclusions on the subsequent diminution of chlorids found in the gastric contents. This argument is not conclusive, as the chlorids may be greatly diminished without the loss of gastric digestion. Further, unless atrophy of the mucous membrane is advanced owing to disease existing before operation, there is, in my experience, usually a progressive increase in the chlorids secreted during the digestion of a test meal. A more conclusive indication of the extent of gastric digestion can be gained from an examination of the feces. Schmidt has shown that only the gastric juice can digest raw connective tissue. I have on many occasions fed patients, after gastro-jejunostomy, on raw beef, but have never found any undigested connective tissue on microscopic examination of the feces.

The Effect of Gastro-jejunostomy on the Motility of the Stomach.—Impairment of the motility of the stomach is a much more serious matter than impairment of its secretion, for it appears that the stomach, if its peptic power be reduced, endeavors to make up for the failure of digestive power by greater energy in moving on its contents. Under these circumstances the food leaves the stomach incompletely digested, but this does not seem of serious import, for Von Noorden maintains that the intestine can vicariously assume the peptic functions of the stomach. I have already pointed out that after gastro-jejunostomy some diminution of the gastric secretion occurs; if then it were the case that gastro-jejunostomy in addition impairs the motility of the stomach, the usefulness of the operation would be considerably curtailed.

Diverse views have been expressed on this subject. Hartmann and Soupault, Rydygier, and Rosenheim found the motility of the stomach permanently impaired; Carle and Fantino, on the other hand, maintain that the emptying of the stomach is hastened rather than retarded. It is, I think, possible that in such investigations the existence of impaired motility before operation has not always been excluded. Although motor insufficiency be present after operation, we can not assume that the insufficiency is due to operation unless we have shown the stomach to have been normal in this respect before operation.

I have investigated the motility of the stomach before and after gastro-jejunostomy in a considerable number of cases, but I will now refer only to three typical examples:

Case 1.—The first of these was a woman on whom I performed gastro-jejunostomy for repeated attacks of hemorrhage from a gastric ulcer. Examination before operation showed that on an average the stomach was empty three and a half

6. Comptes rendus de la Société de Biologie, 1903, 794.
7. Hofmann: Münch. med. Wochschr., May 3, 1898.

hours after a test breakfast. Two months after operation a number of observations showed that the stomach was empty four hours after a similar test meal. You will observe that although the motility was slightly impaired by operation, the delay in evacuation did not exceed the physiologic limits. This case raises the question: How does gastro-jejunostomy influence those cases of gastric ulcer in which the motility of the stomach is not impaired? I will return to this point later.

CASE 2.—The second observation was carried out on a patient on whom I performed gastro-jejunostomy for gastric tetany, with almost complete pyloric stenosis and greatly impaired motility. Two years after operation examination showed the stomach to be empty on two occasions four hours after a test breakfast, and on another occasion, four hours after a full dinner, only 25 c.c. of fluid containing a trace of bile was drawn off.

CASE 3.—Observations on a third patient showed that before operation 20 c.c. of fluid remained in the stomach four hours after a test breakfast. One month after operation, at which a chronic gastric ulcer with dense adhesions to the abdominal wall was found at the cardiac end of the stomach, examination showed that on one occasion 15 c.c., and on another occasion 5 c.c. of slightly green, tenacious fluid, showing a faint Gmelin's reaction, remained in the stomach three and a half hours after a test breakfast.

From these and numerous other observations I think we may conclude that, in those cases in which the motility is markedly impaired by pyloric stenosis or by adhesions, the operation of gastro-jejunostomy usually results in a marked improvement in the evacuation of the stomach contents. In those cases, on the other hand, in which before operation the motility is unimpaired, gastro-jejunostomy may either slightly retard or slightly hasten evacuation, but inasmuch as this retardation or acceleration falls within the physiologic limits we are justified in saying that in cases in which the motility is normal before operation the evacuation of the stomach is for practical purposes unchanged by gastro-jejunostomy.

Is Gastro-jejunostomy a Drainage Operation?—The observations on the motility of the stomach which have already been mentioned are against the view that gastro-jejunostomy is a drainage operation, and W. B. Cannon and J. B. Blake[8] in their invaluable article also put forward strong arguments against such a supposition. These writers, too, from observations on dogs by means of Roentgen rays, have come to the conclusion that in cases in which the pylorus is unobstructed the food continues to pass through the pylorus rather than through the new opening. Are we justified in assuming that this holds good for a human being if the anastomotic opening is made of large size? It is at least suggestive that in the only case in Cannon and Blake's series in which the food passed out through the anastomotic opening rather than through the pylorus the opening which had been made was a large one. This observation appears to me to be a most important one. It emphasizes the necessity for a large anastomotic opening, which is, in my judgment, the most important point in the technic of gastro-jejunostomy.

To What Are the Beneficial Effects of Gastro-jejunostomy on Gastric Ulcer Due?—Most writers have assumed that gastro-jejunostomy is a drainage operation, and have attributed the beneficial effects of the operation on gastric ulcer to hastened evacuation of the stomach. If this be true it follows that, in those cases of gastric ulcer in which the motility of the stomach is normal, the operation of gastro-jejunostomy would be of no avail. This has not been my experience. I have already told you of a case in which the motility was slightly impaired after operation. Notwithstanding this impairment the patient rapidly improved, lost all her gastric symptoms and has remained ever since in excellent health. Indeed, some of the most striking successes I have witnessed have been cases in which before operation there was no evidence of delayed evacuation of the stomach. We must, therefore, I think, look for some other factor than drainage to explain the influence of gastro-jejunostomy on gastric ulcer.

There is a general agreement that hyperacidity is the factor which prevents healing of gastric ulcer. After gastro-jejunostomy there is a marked diminution of the total acidity of the gastric contents, which diminution does not depend on improved evacuation. Are we not justified in assuming that it is to this diminution of the gastric acidity that the beneficial effects of gastro-jejunostomy on gastric ulcer are due?

THE EFFECT OF GASTRO-JEJUNOSTOMY ON THE METABOLISM OF THE HUMAN BODY.

In the year 1897 Jöslin[9] published some observations on the metabolism of two patients on whom gastro-jejunostomy had been performed. He maintained that as a result of this operation there is a marked diminution of the proportion of nitrogen absorbed from the food, and an ever more marked diminution in the fat absorption. These conclusions have been accepted without question. In my book on Gastric Surgery, published last year, I gave details of observations on four patients in whom the absorption of fat and nitrogen was practically unaffected.

There still are writers who dilate on the evil consequences of this operation and of the interference with the physiology of digestion which it entails. Two years ago a distinguished surgeon wrote: "It is improbable that so much interference with the anatomy and physiology of digestion as this operation involves can be tolerated without some ill effects." As recently as six months ago another writer remarked: "The interference with the physiology of digestion which such an operation entails is not well tolerated." He then pointed out the necessity for the existence of the acid medium of the stomach with its pepsin for the digestion of the fat cells and starch granules.

I have already pointed out to you the evidence that connective tissue digestion continues after gastro-jejunostomy, and I will now endeavor to prove, from the further observations which I have made, that these hypotheses about interference with the nutrition of the body are unsupported by chemical pathology or clinical experience. Indeed, it was the remarkable evidence I obtained in investigating the remote history of a large number of patients on whom gastro-jejunostomy had been performed which led me to doubt the accuracy of Joslin's conclusions, and to test their correctness by the touchstone of experimental demonstration.

CLINICAL OBSERVATIONS.

OBSERVATION 1.—This was carried out on a man aged 26, five months after I had performed anterior gastro-jejunostomy for gastric ulcer. During the four days which the observation lasted, the patient absorbed 91 per cent. of the nitrogen taken in his food and 92.3 per cent. of the fat. Now in a series of metabolism experiments on 75 apparently healthy individuals on a mixed diet, Harley and Goodbody found that the highest nitrogen absorption amounted to 97.07 per cent. and the lowest to 90.1 per cent. of the nitrogen taken in the food, the

8. Annals of Surgery, May, 1905.

9. Berl. klin. Wochschr., 1897, 1047.

average absorption being 93.46 per cent. of the nitrogen taken in the food. As regards fats, Harley and Goodbody found that the highest absorption amounted to 98.5 per cent., and the lowest to 90.19 per cent. of the fat taken in the food, the average absorption of 79 observations being 95.05 per cent. If you will compare the results of my observation after gastro-jejunostomy, you will see that the nitrogen absorption is only 2.4 per cent. below the average, and the fat absorption 2.7 per cent. below the average, and both nitrogen and fat absorption are higher than the lowest absorption found in a healthy individual.

Observation 2.—This observation on a patient (also on a mixed diet) seven months after gastro-jejunostomy and suture of a perforated gastric ulcer, showed a nitrogen absorption of 90.5 per cent., and a fat absorption of 92.5 per cent. Comparing these figures with those which I have quoted from Harley and Goodbody, you will observe that the nitrogen absorption is 2.9 per cent., and the fat absorption 2.5 per cent. below the average, but both nitrogen and fat absorption are above the lowest percentages found in healthy individuals.

Observation 3.—This was made on a patient on a mixed diet two years after gastro-jejunostomy for gastric tetany, and I may mention for the interest of those who regard the functions of the duodenum with reverence, that there existed complete obstruction of the pylorus, so that the food could pass only through the anastomotic opening. During four days on a liberal mixed diet (40 kilograms for each kilogram body weight) the patient absorbed 92.1 per cent. of the nitrogen taken in the food, and 92.7 per cent. of the fat. In other words, the nitrogen absorption was 1.3 per cent. and the fat absorption 2.3 per cent. below the average, both nitrogen and fat absorption being above the lowest absorption found in healthy individuals.

Observation 4.—This was carried out on a patient on a milk diet one month after gastro-jejunostomy for gastric ulcer. The nitrogen absorption amounted to 92.7 per cent. of the nitrogen in the milk taken, and the fat absorption 94.7 per cent. Compared with the average absorption of a healthy person on a milk diet, these figures show a diminished nitrogen absorption of 1.5 per cent. and a diminished fat absorption of 1.4 per cent., both nitrogen and fat absorption being higher than the lowest percentage absorption found in a normal individual.

Observation 5.—This was made on a patient on a mixed diet, one month after gastro-jejunostomy for pyloric stenosis. In this instance 92.4 per cent. of the nitrogen and 93.5 per cent. of the fat taken in the food was absorbed, the figures being 1.0 per cent. and 1.5 per cent., respectively, below the average, but both well above the lowest normal absorption.

The preceding observations were made on patients on whom anterior gastro-jejunostomy had been performed; the remaining four observations were carried out on patients on whom I had performed the posterior "no-loop" method.

Observation 6.—This was carried out on a patient on a milk diet one month after gastro-jejunostomy for gastric ulcer. The nitrogen absorption was 91.2 per cent. and the fat absorption 92.3 per cent. of the fat taken in the food, that is, the nitrogen absorption was 3.0 per cent. and the fat absorption 3.8 per cent. below the average.

Observation 7.—This was made on a patient on whom I had performed gastro-jejunostomy for duodenal ulcer with partial stenosis and who was on a milk diet. The nitrogen absorption was 92.2 per cent., and the fat absorption 95.4 per cent.; that is, the nitrogen absorption 2.0 per cent. and the fat absorption 0.7 per cent. below the average absorption on a milk diet in a healthy individual.

Observation 8.—This was made on a patient on whom I had performed gastro-jejunostomy for gastric ulcer. The patient was placed on a milk diet and the observation lasted seven days. During this period the man absorbed 93.5 per cent. of the nitrogen and 94.1 per cent. of the fat taken in the food. In this case the nitrogen absorption was 0.9 per cent. and the fat absorption 0.9 per cent. below the average.

Observation 9.—This, too, was made on a patient on a milk diet twenty-four days after gastro-jejunostomy for gastric ulcer. In this patient 92.4 per cent. of the nitrogen and 96.8 per cent. of the fat taken in the food were absorbed, a diminution of 1.8 per cent. in the case of the nitrogen, and in the case of the fat an increase of 0.7 per cent. above the average.

Taking the whole series of nine observations, the average diminution of nitrogen absorption is 1.7 per cent. and the average diminution of fat absorption 1.9 per cent., while in every instance the variation is within the limits found in individuals who are in good health.

It may be urged that in those cases of this series in which there was no pyloric stenosis the food passed out through the pylorus rather than through the anastomotic opening. If this be true, although I am not prepared to admit it, it does not affect the conclusions to be drawn from the observations. We know clinically that gastro-jejunostomy has a very beneficial effect on gastric ulcer. This effect is probably due to the diminution of the acidity of the gastric contents which the operation brings about. Which route is taken by the food is a matter of academic interest, as it does not affect the therapeutic value of the operation. The important point is that the short circuit does not appreciably affect the metabolism whether the pylorus be patent or not, for you will observe that in those patients who have marked pyloric stenosis the absorption after operation is as good as in those in whom the pylorus is patent.

It is interesting to look back and observe how incomplete knowledge leads to the formation of erroneous hypotheses, and how as knowledge progresses facts apparently irreconcilable become reconcilable. Pawlow showed that the injection of acid into the duodenum causes a flow of pancreatic juice and that the acid chyme passing through the pylorus acts in the duodenum as the normal stimulus of the pancreatic gland. Herein apparently lay the cause of the loss of fat absorption which was supposed to follow gastro-jejunostomy.

Since after this operation the food passes directly into the jejunum, it was urged that the normal stimulus of the pancreas is absent, and that consequently there is a diminished flow of pancreatic juice, and as a result of this serious impairment of fat absorption. Now, Wertheimer has shown that the flow of pancreatic juice can be excited by the introduction of acid into the jejunum, and more recently Bayliss and Starling[10] have demonstrated that the stimulus is not a reflex one, but due to a substance which they call secretin, which is conveyed to the pancreatic gland through the blood stream. Therefore, both the hypotheses as to the diminished fat absorption and as to the cause of this supposed diminution are now shown to be erroneous. The physiologic and chemico-physiologic facts as we know them agree, for I hope that I have been able to prove that the digestion and metabolism of the human body are practically unaffected by the operation of gastro-jejunostomy, while the researches of Wertheimer and Bayliss and Starling tell us why the alteration of the route taken by the chyme does not prevent adequate stimulation of the pancreatic gland. Is it not a striking example of the wonderful power which Nature possesses of adapting herself to the altered conditions brought about by surgical intervention?

These experimental observations are supported by the evidence of clinical experience. May I remind you of

10. Proceedings Royal Soc., 1902, 352.

one striking fact. As I have pointed out before, there are at the present time children alive and in perfect health on whom this operation was performed in early infancy. It is inconceivable that they would have lived for six or seven years and developed into strong healthy children had the operation the harmful effects which have been attributed to it.

Lastly, let me say this: Just because gastro-jejunostomy is not in itself harmful, there is a danger that we may be tempted to resort to it in doubtful cases in the hope that good may come. Great as is my respect for gastro-jejunostomy, I am no advocate of such a course. To operate for subjective symptoms in the absence of definite clinical and chemical signs is, to say the least, unscientific. Above all, we must guard against the failure and discredit which results from operation on neurasthenics and on those patients who, as Dr. W. J. Mayo so pithily puts it, "have had their movable organs fixed and their removable ones removed." Such persons, as we all know, are often only too ready to tempt fortune further at the shrine of surgery. Neither gastro-jejunostomy nor any other surgical procedure short of the removal of the higher centers of their brains will cure such of their ills.

The technic and statistics of gastro-jejunostomy I do not purpose to discuss. They have been recently fully dealt with in addresses delivered before this association. If you will allow I should, however, like to bring to your notice two time-saving devices which I have found of great value. The first is this set of suture reels. Each reel is of a different length so that the different sizes of silk or thread are wound on different sized reels, and the surgeon is able to see at a glance without examination of the suture material, which size of ligature he requires during the course of the operation.

The other device is this pattern of needle, which may be called a "grip-eyed" needle. It is designed to obviate the inconvenience and delay caused by the accidental unthreading of needles during suturing, and is especially adapted for continuous suturing. By pulling the suture firmly into the extremity of the eye furthest from the point the thread is firmly gripped so that it can not slip out.

SUMMARY.

To sum up, we are, I think, justified in drawing the following conclusions as to the physiologic effects of gastro-jejunostomy:

1. A certain amount of bile and pancreatic juice enter the stomach after gastro-jejunostomy, but the amount is small and has no injurious effect.

2. The acidity of the gastric contents is markedly diminished, usually about 30 or 35 per cent. This is due partly to a diminution of the total chlorids secreted, and partly to the partial or complete neutralization of the free hydrochloric acid by the alkaline bile and pancreatic juice, and probably also to earlier stimulation of the pancreatic secretion, and compensatory earlier fall of the gastric secretion. In gastric ulcer cases the removal of spasmodic stenosis of the pylorus likewise tends to diminish the total acidity.

3. Gastric digestion is impaired but not lost after gastro-jejunostomy.

4. The motility of the stomach, if normal before operation, is for practical purposes unaffected. Gastro-jejunostomy is, therefore, not a drainage operation. Its beneficial effects on gastric ulcer are due to the diminution of the acidity of the gastric contents.

5. Gastro-jejunostomy has no material effect on the metabolism of the human body, the percentage of nitrogen and fat absorbed being within the limits observed in individuals who are apparently healthy. This chemico-pathologic evidence is supported by evidence of clinical experience.

In conclusion it is my pleasant duty to thank you one and all most cordially for the honor you have done me in inviting me to address this meeting of your association. Conscious as I am of the fragmentary nature of my remarks, I would remind you that just as "Nature exists in leasts," so the science of medicine has been built up by the accumulation of little facts. I venture to think that the dry bones of the observations which I have put before you are in reality clothed with the interest of practical importance in the surgery of the stomach.

Be that as it may, this at least I hope, that such visits as mine serve as an evidence of that good fellowship which should, and I believe does, exist between members of our profession in the old world and in the new. Although separated by the sea, we are united in the brotherhood of our common art. May we each glory in the share the other takes in its advancement. Let us say, as Marcus Aurelius said of old, "What matter by whom the good is done"?

And here may I pay a tribute to those in your country, some of whom now no longer speak to us, who have played so great a part in the progress of gastric and intestinal surgery. To mention only a few of these, the work of Halsted and Cushing on intestinal suturing, the work of Murphy on intestinal anastomosis, and the brilliant results of the Mayos, Ochsner, Finney, Deaver and others, are landmarks in the history of the surgery of the stomach. And let us not forget the early work of Senn, the father of intestinal surgery, and of O'Connor, whose conception and intrepid execution of the first total gastrectomy gave a powerful stimulus to gastric surgery. All honor to those early pioneers. Let us strive to follow in their footsteps.

"Science moves but slowly, slowly, creeping on from point to point;
Men, my brothers, men the workers, forward, forward let us range."

The science and art of surgery is incomplete and incompletable. We are aiming for a goal which we may never reach, but as your great writer, Emerson, says:

"The persuasion that we must search that which we do not know, will render us beyond comparison, better, braver, and more industrious, than if we thought it impossible to discover that we do not know, and useless to search for it."

DISCUSSION.

DR. JOHN J. GILBRIDE, Philadelphia, has been interested in the question of metabolism following the operation of gastroenterostomy for several years. Most surgeons, he said, have been of the opinion that the operation of gastroenterostomy is purely a mechanical one and not a physiologic procedure, but Dr. Paterson's investigations show that the operation has a physiologic basis, and that the amount of nitrogen and fats absorbed are not decreased but actually increased. Most other observers have shown that bile is constantly present in the stomach following gastroenterostomy. At first the amount of bile present is rather large; later it becomes less, and finally, after several months, it is present only during the process of digestion. In reference to the lowered secretion of the gastric juice, Dr. Gilbride said that Mintz was the first to point out that following gastroenterostomy there is a reduction in the amount of gastric juice, and in some instances the chemical constituents of the secretion are so reduced as to render that secretion little more than water. Dr.

Paterson showed that there is a reduction of the chlorids in the gastric secretion, but the amount is not sufficient to materially disturb digestion. So far as the beneficial effects of the gastroenterostomy on the ulcer are concerned, Dr. Gilbride believes that there is an increase in the rapidity with which the stomach empties itself, together with a lessening of the irritating effect of the gastric contents passing over the surface of the ulcer; and that there is also a reduction in the total acidity of the gastric contents. As to the effect of the short circuiting of the gastric contents on the secretions of the duodenum and pancreas, Dr. Gilbride mentioned that Pawlow is of the opinion that it is necessary to have the acid gastric contents pass over the surface of the duodenum in order to excite this secretion. However, Wertheimer and others have shown that this is not necessary, as was pointed out by Dr. Paterson; that when the gastric contents escape directly from the stomach into the jejunum there is an excitation of the secretions into the duodenum.

Dr. Walter B. Cannon, Cambridge, Mass., did not consider gastroenterostomy a drainage operation. In the stomach there are peristaltic waves going toward the pylorus. There results from these waves increased pressure on the food as the pylorus is approached. If there are two openings for the food to go through, the pyloric opening and the stoma, the food will go out through the pylorus rather than through the stoma. Another result of these waves, he said, is that the peristalsis, as it mixes the food, mixes it in the pyloric end rather than in the cardiac end of the stomach. The food comes out through the pylorus as a thin fluid. It does not go out through the stoma because of the thicker consistence the food has in regions somewhat remote from the pyloric opening. The observations which Dr. Blake and Dr. Cannon made were made with the Roentgen ray, and there has been some question whether the pictures seen were true pictures. However, their results have been recently confirmed by observations made in the College of Physicians and Surgeons of New York City. A string was fed to dogs with a small bag of shot tied to the end of the string. In almost all of the cases it was found that the string passed out through the pylorus and thus into the small intestine. Many other observations were also made. The stomach was connected with the lower ileum and also with the colon, and the animal, for a time, gained in weight, which could not be possible if the food did not go out through the pylorus. Dr. Cannon thinks we are justified in concluding, therefore, that when there is a double way, the natural and artificial, the natural passage will be taken and not the artificial. Dr. Paterson, he said, mentioned one case in which they had a large opening, and stated that the food went out both ways. That was true only when fluid food was given; in this case semisolid food went out only through the pylorie opening and through the stoma.

Dr. J. W. Draper Maury, New York, thought that it might be interesting to direct attention to the experiments just referred to by Dr. Cannon. At the Surgical Research Laboratory they took a dog on which a gastro-jejunostomy had been done. The animal was fed with a piece of meat with a small bag of shot tied to it. After several days the animal was opened and the course taken by the string, which had been tied to the pterygomaxillary ligament, was studied. A number of such experiments were carried out, and in but a single instance had the bag of shot passed out through the stoma. In every other case it passed out through the pylorus. In the one exception the string passed down through the stoma, but instead of going on it came toward the pylorus, entered the stomach again, again passed out through the stoma and back into the stomach through the pylorus, completing two cycles. A second series of experiments was made to show whether the food passed through the pylorus or not. A very low gastroileostomy was done. Animals so operated on invariably gained in weight for a short time, about a week; then lost weight very rapidly and died; probably not because of the fact that the stomach was not functionating, but for other reasons. Another series of experiments was done with a piece of string. A gastroenterostomy was done at about the middle of the ileum and allowed to heal thoroughly. Then a piece of string was fed and attached to it a piece of meat of undigestible type. The free end of the string was tied to the pterygomaxillary ligament and left long enough to come half way down between the pylorus and stomach. A few days later the animal was fed fat. An hour afterward the animal was opened, and the lacteals on the oral side of the meat were gorged; those distal to it, between the meat and the stoma, were empty. The conclusion is either that no fat goes through the stoma, or it may be that no pancreatic juice was able to pass the temporary obstruction.

Dr. Herbert J. Paterson, London, England, thought that experiments on animals are open to criticism. He said that we are scarcely justified in assuming that the conclusions drawn from observations on aimals hold good for human beings. The experiments in which animals were fed on bags of shot are undoubtedly of great interest, but at the same time the interest is an academic one, for he, for one, is not in the habit of feeding his patients on such indigestible food. It does not interest him as a surgeon whether bags of shot pass out through the pylorus or through the anastomotic opening. Such experiments interest us as scientists, not as surgeons. The practical point which Dr. Paterson endeavored to bring out is this: that whether the food passes out of the stomach through the pylorus or through the artificial stoma—whether the pylorus is patent or not—the existence of a short circuit between the stomach and jejunum has for practical purposes no effect on the metabolism of the human body, while we do know that it has a very beneficial effect on gastric ulcer. Therefore, he submits that when the operation of gastro-jejunostomy is deemed advisable clinically, one need not, on physiologic grounds, hesitate to perform it.

ANATOMY OF THE PALATE, NORMAL AND CLEFT.*

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It is not my purpose to describe in detail the anatomy of the palate, normal and cleft, but to point out the deviations from the normal as observed in the cleft. In the human embryo of about the third week, the face is in progress of development. From the front of the cephalic mass five tubercles bud out, of which the middle one passes vertically downward. This tubercle is double, and in it the intermaxillary bones are developed which contain the incisor teeth. Therefore, it bears the name "incisive tubercle."

The rudimentary superior maxillary bones, which are widely separated, are developed at each side of the incisive tubercle, though not united with it. While the fourth and fifth tubercles are separated in front, they subsequently unite in the median line to form the mandible.

Simultaneously the palate begins to be formed by the approach toward the median line of the two horizontal plates, developing from the maxillary processes on either side. If the palatal processes of the superior maxilla unite in the median line and blend also with the incisive bones, and the vomer grows downward to meet the palatal processes in their line of union, the upper jaw and lip will be normal. If, however, the superior maxillary and intermaxillary processes fail to unite with each other, cleft palate and harelip in one of their many forms will result. In the presentation of this subject, I desire to point out the cause of the deformity in question and a method of practice tested by the lapse of many years, by which the defect may be overcome at a time in life when it can be most easily and successfully accomplished.

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

WHAT IS THE CAUSE OF CLEFT PALATE?

The literature on this subject is voluminous and largely theoretical. In reviewing this literature, we find a great similarity of views expressed by various authors. Heredity, prenatal impressions and imperfect nutrition during the early months of gestation are assigned as causes.

The condition of the mouth of a child who has a congenital cleft palate is described thus: "Want of coaptation, resulting from defective formation in the palatine plates of the maxillary and palate bones, is the cause of congenital deficiencies of the parts in question." Again: "The palate plates are arrested in their growth and permanent fissure of the palate is the result. The principal effects resulting from an absence of a portion of the palatine organs are an impairment of the functions of mastication, deglutition and speech." The definition generally given for cleft palate is: "A congenital deformity characterized by a fissure or fissures of the palate, due to arrested development."

From the foregoing quotations, we find that the opinions expressed are, that congenital cleft palate is the result of incomplete development of the tissue necessary to enter into its complete formation.

The opinions of authors thus expressed have been based, no doubt, on their observations of the open space between the oral and nasal cavities.

The deformity is not the result of "defective formation in the palatine plates," nor "congenital deficiencies of the parts in question," nor "arrested growth of the palate," nor "absence of a portion of the palatine tissue." All children who have congenital cleft palate, with rare exceptions, have in the palate the normal amount of tissue, although it is not united in the median line; it is cleft.

Congenital cleft palate has a predisposing and an exciting cause. The predisposing cause is heredity. The exciting cause is mechanical, the application of force in embryo. I have little faith in the theory that prenatal impressions cause failure of union of the bones in question. In the greater number of cases in which this cause has been given, on inquiring, it has been found that the mental shock occurred subsequent to the time when, if physiologic processes were not interfered with, union of the bones would be complete. It is too apparent to require argument that a mental impression could not separate a suture. Prenatal impressions, possibly, may be a factor in causing failure of union, but we have no authentic evidence to that effect.

I believe, however, that defective nutrition, or general debility of the mother during the early months of gestation from any cause, may delay union of the palatal plates. Nature does not fail to develop the necessary bone and soft parts to form a normal palate. But it does fail to bring the parts into apposition and unite them.

The bones having failed to unite prior to the fifth month of intrauterine life, the mandible, as soon as the muscles of mastication become active, brings pressure on the palatoalveolar inclined planes of the ununited superior maxillary bones, and, acting as a wedge, forces them apart and widens the breach. Moreover, the pressure of the tongue and the flexed position of the head with the symphysis of the mandible resting on the sternum may contribute to some extent to the force which is exerted by the lower jaw on the palatal arch and which forces the bones apart.

Having operated on over 1,300 cleft palate patients, over 400 of whom were infants under 6 months old, I have found that the breadth of the upper jaw, as compared with the lower, is just as much broader than it should be as the distance between the borders of the fissure. When we bring the borders of the fissure into contact, we have brought the upper jaw back to its normal breadth and to its proper relation with the lower jaw. There are very few exceptions to this statement.

In young infants who have cleft palate, I have always found that by slightly forcing the chin upward the pressure of the lower jaw against the segments of the upper jaw will spring the cleft bones apart.

Writers who have given a great deal of thought to the subject and who have dwelt at great length on its etiology, those who have proposed the more generous use of phosphatic food for the mother during the period of gestation have been unconscious of the fact that the bones are not, as a rule, defective in structure nor incomplete in development. There is failure of union.

SUMMARY.

The causes of congenital cleft palate are:

1. Heredity.
2. Mechanical force exerted by lower jaw against the upper jaw in embryo.

In congenital cleft palate in young infants, the full amount of tissue is developed to form a normal palate; the defect is due to failure of union. General debility of the mother in early months of gestation may be a factor. Prenatal impressions possibly, but evidence not conclusive.

Treatment.—Close the separated bones within three months after birth when the bones are soft and easily bent and moved into correct position. The hard palate should be closed before the lip operation. The lip operation should follow within three months after the bones have been united. The soft palate to be operated on last, preferably when the patient is about 14 to 16 months old.

WHAT SHOULD BE THE ATTITUDE OF THE PROFESSION TOWARD THE HYGIENE OF SCHOOL LIFE?*

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In a recent number of the *Medical Record* the statement is made that "a conference of the masters and medical officers of the great schools of England is to be called to consider the subject of the hours of sleep necessary for the scholars: a course fully justified by the importance of the question."

We read in the public prints that the second International Congress on School Hygiene is to be held in London next August under the patronage of the King and the presidency of that eminent physician and philanthropist, Sir Lauder Brunton. I quote from the prospectus:

> The marked success of the First International Congress in School Hygiene, held in Nuremberg in 1904, in bringing together workers of all countries, and in giving an impetus to this work, has already been signalized by increased literary activity in nearly every country. . . . One of the happiest results of the Nuremberg Congress was that members of various professions, teachers, medical men, architects, engineers, administrators, officials and manufacturers, appreciated

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

how intimately their work and duties were correlated, and also learned how greatly each was indebted to the other. . . . One of the aims of the congress was to coordinate the efforts of these various workers, and to aid each separate investigator.

Here are gratifying evidences that in England a great advance has been made since Herbert Spencer recorded his disgust that the English landed gentry would spend hours of their time daily discussing the best methods of breeding cattle, but avoided the consideration of the education of their own children as something quite beneath their notice.

But how about America? Has anyone ever heard of a conference between medical men, architects, engineers and public officials in regard to school hygiene? Have the masters and medical officers of the great schools in the United States ever met to confer on the number of hours that school children should sleep? Might it not possibly seem slightly *infra dignitatem* for some of our highly-cultivated LL.D.'s and S.T.D.'s to meet some of our professors of the science and practice of medicine to talk over the hours of sleep most suitable for a school child? And yet any reasonable person will acknowledge that, so far as the welfare of the child is concerned, the regulation of its habits of life is far more important than a consideration of the force of the digamma or the elucidation of Babylonic inscriptions. In fact, I will go further than this and assert, without fear of successful contradiction, that the value of health and happiness is so much greater than the value of mere erudition that an investigation of the proper hours of sleep is of vastly more importance than any learned discussions whatever.

Our present ill-advised system of public instruction is constantly defeating its own ends and turning out invalids, cranks and "bookful blockheads ignorantly read," simply for the want of a well-balanced curriculum of instruction, according an appropriate place to physical education.

I am aware that a society for the promotion of school hygiene exists in this country, but I have not been able to learn the particulars of its scope or organization. There are also various committees, like the Committee on Physical Welfare of School Children of New York City, which are doing excellent work along these lines, but there is a lamentable want of correlation between the efforts of such bodies of workers and the boards of education. Unfortunately the medical profession in the United States seems inclined to keep strictly aloof from questions of school policy. The health of school children has been studied a great deal and much valuable matter has been collected and published, but this has yet to be systematized and made available for general use in the school room in the every-day life of the scholar.

It is by information, not argument, that the public is convinced, and we are now in the stage of collecting a vast quantity of information in relation to school children which bids fair to be of great use later on.

It is abundantly true that the science of hygiene has outrun its practical application in every direction, and in none more markedly than in the hygiene of school life. Splendid work has been done in Chicago, Boston, Brookline, Mass., and other places in this country, as well as in various foreign countries, notably in Germany; and that the need is there felt of amalgamating and systematizing the work of different agencies is shown by the call for the International Congress from which I have already quoted.

A striking evidence of the utter want of harmony between those interested in school hygiene in New York City was furnished at a conference between the commissioner of health, the superintendent of schools and the committee on the physical welfare of school children, recently held in the Academy of Medicine. The last named body was especially anxious to secure funds for the prosecution of their most valuable and interesting work from the board of estimate and apportionment. I paraphrase an extract from the report of the meeting which appeared in the New York *Sun:*

Had everyone present agreed that these things ought to be done, the discussion on both the theoretical and practical sides of the issues involved would have been complex enough. When, however, it developed soon after the opening of the evening session that the representative of the board of education did not in the least agree with the health commissioner on questions of policy and detail, and that neither of them was prepared to endorse the sentiments of the chairman of the conference, everything became so tangled that the audience simply gave up trying to understand the knotty points, and contented themselves with applauding the dramatic efforts of the speakers.

A number of teachers were present and tried to help unravel the difficulties of the situation. Some of the ideas expressed were, however, impracticable, and some were too indefinite to be of value. Such a conference, however, is a step in the right direction. The problems of school hygiene will not be solved in a moment. Many of them are still unsolved after years of study.

A school superintendent in a nearby city wrote to me once that in his opinion a medical director should be connected with every school, who should have the power to close the school, shorten the hours of study or take any other steps which he might deem necessary for the health and well-being of the scholars. Nor does this gentleman stand alone in saying to the medical profession, "Come over into Macedonia and help us."

The medical inspection of schools, now so generally adopted, has received, so far as I have been able to learn, the unqualified approbation of the teachers, who desire its extension and perfection.

These are said to be the times of great unrest and nothing has felt the impulse of change and innovation more than the so-called systems of education. As physicians, however, we are not concerned in the ultimate fate of the humanities or the triumph of the utilitarian branches of study. We are, or we should be, interested in the place which physical education shall hold in the instruction of children, and we must do our share in the solution of this difficult problem. Parents and teachers alike are looking to us for help. In one case at least, that has recently been reported, legal aid was called in to prevent overstudy in the high schools in Brooklyn. A presentment was handed up by the Grand Jury of Kings County, New York, after their examination of several members of the board of education and the principals of the high schools, containing a recommendation that home study by the high school pupils should entirely cease, as the jury had reached the conclusion that these scholars were being forced far beyond their capacity to absorb and retain knowledge. This is the only instance that ever came to my knowledge in which legal aid has been invoked to limit the number of hours which pupils in the public schools shall devote to study.

It would be interesting to know the qualifications of the particular grand jury which took such a decided stand in regard to home study, because they have handled without gloves a question in regard to which they

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possibly were not competent to express an opinion. The instance is referred to here chiefly as it illustrates the dissatisfaction with public school methods which seems to be exceedingly common at the present writing, and which is no doubt largely due to the uncertainties and contradictions which appear in so much of the present writing and talking on the subject of education.

It is unquestionably true in educational matters, as in many others, that "unwarranted conclusions are being drawn and hasty proposals made in the matter of legislation because of the lack of a broad basis of evidence and careful statistics." Such instances, however, as the action of the Kings County Grand Jury serve to emphasize the greatly increased popular interest in questions of education, as well as in those of health.

As was recently pointed out, the leading popular magazines a short time ago would uniformly decline to publish papers on health and hygiene which to-day they are glad to publish and are willing to pay $100 apiece for. This is solely because the public demands instruction in hygiene, and the magazine editors must provide it or the sales of their publications will fall off. The public is particularly anxious to learn something authoritative in regard to the hygiene of school life and the care and rearing of children. This demand comes not alone from those eager for sensational literature, but from our most earnest and philanthropic citizens. It is generally agreed that something is wrong, and the agitation will go on until the faults are discovered and eradicated.

It has been asserted in popular literature that several thousand children in New York City go to school every morning without their breakfasts. This statement naturally claimed considerable attention and led, I believe, to the inauguration of a movement to provide breakfasts for these children at the expense of the city. An investigation by the board of health, however, disclosed the fact that the children really did go to school breakfastless, not because no food was provided, but because they could not eat after the night spent in their ill-ventilated and overcrowded tenements. The Committee on the Physical Welfare of School Children also found that only 1.1 per cent. of 1,500 children investigated were not provided with some breakfast.

While no doubt sensational writing on this subject has served a good purpose, it is scarcely sufficiently broad in its scope or moderate in its statements to aid materially in the scientific solution of the social problems of the day. As has been well said, "The sentimentalist is of excellent service, provided that he or she be not permitted to make the laws before the physician, the statistician and political economist have had time to give reason and justice to the measure of relief proposed." According to Professor Gomperz, "The physician can never be absent from his post in the campaign against the encroachment of fancy on the domain of reason."

There has been much dispute, as you are aware, as to the age at which school life should begin, as well as to the number of hours which should be spent in school each day. Just now we are told by some that a school recess is unnecessary because certain rhythmical movements, called gymnastics, in which the pupils are made to indulge, may profitably take the place of the unorganized and crude motions in which the children naturally indulge in their play. Such reasoning shows the same breadth of mind and grasp of the important play-problem in education as has been evinced by those who would forbid a little child the delight of "Mother Goose's Melodies" because of their inherent improbability.

Some observer has laid down the dictum that he has never met with a case of chronic bad spelling in which there was not some defect of vision. This at first sounds convincing until we reflect that the normal eye is much more infrequent than that, now partly extinct, variety of public school scholar, the good speller. Here then is another place in which the services of the well-trained and broad-minded physician are needed. No doubt the perfunctory examinations of the eyes and ears of the scholars perpetrated, for the most part, by the already overworked teachers are better than no examinations, yet they are entirely inadequate to detect any but the grossest lesions and they have been so imperfectly applied that many pupils have been sent to oculists and aurists for treatment of which they stood in no need.

In the matter of teeth also experts should be employed for inspectors, as recommended by Dr. Osler, who has said, in effect, that he considers the question of sound teeth of greater national importance than that of the restriction of the consumption of alcohol.

A "hospital" school was started in Chicago to furnish proper instruction for slightly subnormal and invalid children to provide laboratory facilities for the scientific investigation of the phenomena connected with their conditions, as well as to afford special training for the teachers and nurses for this class of pupils. It is reported that 60 per cent. of the children who have received instruction and medical care in this institution are now working with normal children in the regular schools. Truly a gratifying result, showing again the great and beneficent truth that Nature is wondrous kind and that if one will study her laws and give her the aid she requires at the time that it is required, great and unexpected good can be wrought out for the unfortunate and backward child.

The old procrustean method of education dubbed the unfortunate waif a dunce, and then proceeded to shut out all hope by condemning him to tasks which he could not master and rendering his mental confusion and darkness worse, if not irreparable, by punishment and derision until he was driven out into the streets, if a poor man's son, to become a vagrant and a law-breaker, and if the offspring of wealthy parents to pass a scarcely more profitable existence, possibly in a sanatorium or under the care of a keeper.

That some more efficient supervision must be exercised over the school sports, which should be recognized as a part of the education and in which all the pupils and teachers should participate, the following goes to show. Murphy, the well-known trainer of college football teams, said some time ago that boys under 16 years ought not to be allowed to play hard football games. I quote his words:

> The greatest evil in trying to develop university football players is that so many otherwise promising players are strained by hard playing before they are sufficiently developed in growth or strength to stand the great strain of football in other than purely friendly or boyish games under some sort of watchful and intelligent direction by their elders.

With this sentiment I am disposed to agree fully, after having watched with some care the training and development of a high school football team during the past year. Here seems to be a menace to the best interests of the most promising of our school boys quite analogous to the injury which too early attendance at

kindergarten and school inflicts on the public school scholars generally, and here is another of the places where the medical profession must interfere.

That interscholastic and even freshmen football contests should be abolished or modified I am strongly inclined to believe, yet there is no movement on foot to do this any more than there is to prevent too young children from the mental strain of too early attendance at school, in consequence of which they are listless, pale, sleepless and introspective at 10 or 12 years of age.

These are questions of the utmost importance. How shall they be met?

I believe that to provide the proper sort of physical instruction a special class of physicians will have to be raised up. Men of special fitness, themselves athletes or practical gymnasts, adepts in physiology and personal hygiene, who have had wide clinical experience with ordinary cases of sickness, and who are beside expert dietitians and have themselves enjoyed a university and a hospital training. Such are the physicians who should become the professors of physical training in our high schools and colleges.[1]

But let us never lose sight of the fact that the most important years of a child's education, both physical and mental, are the earliest years, and that, as pointed out by German educators years ago, a glaring fault of educational methods in the United States is that we put our youngest and most inexperienced teachers to do the most important work, namely, the instruction of the youngest children, so the most important work that the physical educator would have to do would be the teaching of the youngest children and the protection of their delicate bodies and pliant minds from the injuries now too often inflicted on them in their school life.

Besides these highly trained physical instructors, all the teachers will have to know more of the body and its functions. Physical education must be so taught in all the normal schools that the teachers shall become experts in the physical condition of children. Certainly they can soon learn by observation to determine whether any particular child feels well or badly, and if he is falling behind in his studies as well as in his weight and bodily fitness, whether this is due to ill health, neglect, bad surroundings or bad habits. Hoffmann has said, "It is probable that our public schools are as great producers of ill health as the mills."

In conversation with a superintendent of schools once I was informed that since a ventilating system had been put into an unhygienic old schoolhouse the town had saved the cost of the improvement in a short time in the salaries which they would otherwise have been obliged to pay the extra teachers to take the places of those made sick by the foul air of the building. He added that the ventilation of the building was still far from satisfactory.

This leads one to observe in passing that, in some schools at least, our present overloaded system of public school instruction is unspeakably cruel and exacting on the teachers. But we rarely give them a thought, and they seem to be too long suffering to complain. The physical director would relieve them of a part of their burden by assuming charge of the child's physical education and bodily welfare.

Thorough and painstaking examinations of the whole body and of each particular function of every pupil should be regularly made, and a complete chart should be filled out and compared with the admirable tables drawn up by Dr. Christopher and others after the careful weighing and measuring of many school children. I believe that such charts are now filled out and kept in some schools, not probably very exhaustively done and seldom, I suppose, sent to the parents.

The examinations of the physical condition and bodily development should occur just as regularly as those for mental prowess; marks should be given and should always be considered before the child is promoted. A child physically unfit to go into a higher grade should be dealt with as the case may demand. It might be either kept in the same grade, kept out of school for a longer or shorter time, or allowed to take only a part of the studies in the new grade. These points should be determined after a careful consultation between the physical director and the teachers of the other branches.

It is simply impossible to conceive of the number of broken hearts among the parents and of wrecked lives among the children that would be prevented by the simple rule of only promoting those children who are physically fit. If we add to this refusing a teachers' certificate to any one unable to pass a strict physical examination and the requirement that the teachers shall mingle in the children's games, we shall have made a long step toward the physical millennium toward which we believe the world is advancing.

As to the proper regulation of this physical instruction, and the providing of good men and women to do the work:—much of the examination and instruction of the girls would have to be done by women, who are, if anything, better adapted than men for the work;—the correct inspection of school houses and playgrounds and, in fact, the entire question of physical education, should be under a special board in each state; as suggested a few years ago by Dr. Cook, then Chairman of the Section on Diseases of Children of the American Medical Association. A board of five members, two at least of whom should be physicians, specially qualified for the work, should be appointed by the judges of the supreme court of the state. Let them receive adequate remuneration for the proper performance of their duties. This commission should have control over all the questions that we have hinted at; should appoint the physical instructors and supervise the inspection of the scholars and of the school houses, and should have the power to shut up any school in the state in which the laws, not alone of the state or of the United States, but of health and hygiene, are being violated.

The duty of our profession in the premises is to see that properly qualified men are put in office; that adequate legislation is enacted, and that this movement shall receive the proper support. So far from antagonizing the people by such a movement, we shall win their hearty cooperation. As hinted before, the medical profession have heretofore rather assumed the position of hanging back, and, according to the movement of securing a sound physical education for all our youth, faint praise or half-hearted acquiescence.

1. Since this paper was writtten I have read with interest Dr. Nicholas Senn's Jerome Cochran Lecture, delivered before the Medical Association of the State of Alabama (THE JOURNAL, A. M. A., June 1, 1907), in which he advocates the foundation of hygienic institutes "where young physicians can receive the necessary education and training to prepare themselves for the high and responsible office of sanitary or health commissioner in the different communities." A somewhat larger scope must be given to such an institution before it can turn out the properly qualified medical director and physical instructor in the public and private schools. Yet there is no doubt that there is the same crying need for the latter as for the former class of experts, and that the same or similar facilities should be provided for their training and education.

But I assure you, my brethren, that the movement is now so strong that no power on earth can stop it, and that, unless we fit ourselves by study and experience to take our part in it, we shall not only fail in our duty to our day and generation, but the places that we should hold will be snatched from us by a body of physical educators raised to meet the growing demand, and we shall lose both in prestige and influence by their usurpation.

We must be up and doing. The proposition to appoint by law in each state a commission to take charge of the physical instruction in every public school and also, if need be, to look after the proper execution of the child labor laws, appointed by the judges of the supreme court of the state, in order to avoid, as far as possible, the cankering touch of politics, is a good one, and should receive our untiring and united support.

This matter should be brought up in each state society and advocated by as many of the state journals as can be enlisted in the work. I repeat that its importance can not be over estimated. There is a hiatus in the scheme of the physical education of children which only the expert and especially trained physician can fill, and the profession must see that such experts are provided, that they shall receive the recognition and exercise the authority which the great responsibility they will have assumed entitles them to. The problem of the proper education of our children can not be solved without just such expert skill, and these experts can not, it seems to me, exercise the proper authority and wield sufficient influence unless the enlightened and instructed medical profession shall stand solidly behind them.

Our duty is very plain. Let us at least not lag behind our English colleagues in doing our part in this great forward movement.

DISCUSSION.

DR. MARY MCCAY WENCK, Sunbury, Pa., said that educating only school and college graduates as to the inevitable evil results of disease following wrongdoing does not reach the masses of young people. In Sunbury there is an immense silk mill employing about six hundred girls, many of whom are innocent country girls, entirely ignorant of the existence of vice. Some way should be found to educate them on this most important subject. Dr. Wenck asked: When patients present themselves with venereal troubles must the physician give to the unsuspecting wife an unvarnished statement regarding her condition? Is it the physician's duty to call a spade a spade to her? If it is a duty, Dr. Wenck fears that the divorce courts will be overflowing.

DR. S. A. KNOPF, New York City, said that there is not only a physical hygiene, but a mental and a moral hygiene which must be considered. In New York an effort has been made to improve the morals of children by removing adenoids—by attending to physical defects. In the truant school it was found that when adenoids, eyes and teeth were attended to there were fewer truants and the children became well behaved, and by and by they could be sent back to the other school. There is just as much physical as mental hygiene. There is a large population in all cities in which the child is underfed, and, while Dr. Knopf does not believe in pauperizing, he believes, he said, that when a child is going to school in the morning, with little or no breakfast and having for a lunch an apple and a cracker, that child can not do good work. In Berlin it was found that if the municipality appropriated a certain amount of money and gave such children a meat sandwich and one or two glasses of milk at noon they did better work, improved in weight and were better behaved. Many thousands of school children in New York are myopic, astigmatic or have other defects of vision, and the result is that they can not see the blackboard; they are defective and are put back without any fault of their own. An effort is being made to have glasses provided. The children are sent to special clinics for diseases of the eyes and glasses are prescribed. The children are then sent back to the family physician, and if he does not attend to the matter they are sent to the dispensary. Now it transpires that there is not enough money to buy the glasses, so many are needed.

Dr. Knopf referred to the value of visiting school nurses and referred especially to a certain parasitic movement of the head which is frequent among the poor of New York. In former years a child so affected was simply sent home because it had a contagious disease. Finally, Dr. Biggs and Dr. Darlington, of the health department, created a corps of nurses, whose sole duty it was to clean the heads of the little ones. They attended to them, sent them home, and these children, instead of losing eighty days of school life, lost one or two days. That shows the value of attending to little ones while they go to school.

DR. G. W. DRAKE, Hollins, Va., said that not only is it necessary to look after the prevention of bacterial diseases, but to look also to the prevention of what he calls self-produced diseases—diseases resulting from unhygienic habits of various kinds. Sufficient attention has been paid to ventilation, heating, lighting, but more than that is necessary: the curriculum of the schools needs to be looked after. The study hours, the sleeping hours, the resting hours—all these need to be looked after; and especially do physicians need to give advice as to the examinations. The examinations in some schools are ruinous, are destructive to health, destructive to life, and the trouble with our teachers is that they are not themselves educated in the true sense of the word. Education means a proper development or leading out of every organ of the body in symmetrical proportion, not the development of one to the detriment of another. That needs to be looked after. Dr. Drake has tried to impress on teachers the fact that what we call mental education is not all that they have to look after—that they must also look after the education of every part of the body: the education of the liver, the lungs, the muscles and of every department of the brain. The brain is not one organ; the motor areas of the brain, the sensory, and all the areas of the brain must be educated to fit them for their function; and the trouble, he says, is that presidents of colleges and principals of schools and educators generally are not acquainted with physiology and hygiene. Dr. Drake has said that no man should go out from a theological seminary to preach the gospel who had not first obtained a diploma in physiology and hygiene. It ought to be compulsory. Every one has been taught physiology in the primary department, and yet in the higher departments it is not studied. It should be taught as thoroughly in schools and colleges as in our medical colleges—in fact, even better. It should be taught more practically, and every physician, Dr. Drake declared, should possess a diploma in physiology and hygiene. Whenever that stage is reached, we will have proper education of our children and we will have healthy children. Educated men have undergone such a strain of examination and hard study that on leaving school with their diplomas they are not qualified to do the work for which they were educated. Students should be taught when to eat, how to eat, what to eat; when to sleep, how long to sleep, when to study and how long to study. Dr. Drake said that he heard a principal of a school say that the greatest enemies that higher education has are the doctors, and he thought it a compliment to the doctors.

DR. PAUL PAQUIN, Asheville, N. C., said that in North Carolina there is a state law making the school system neutral as to politics. In Asheville, under that principle, there is no friction whatever, and it has been possible to establish a system of medical supervision of all the schools. There are black and white schools there: the colored schools under colored physicians, the white schools under white physicians. On the Asheville School Board there is a physician as trustee, and, besides that, inspectors for every school. The teachers are all taught to take temperatures—to examine children as they come in and to call a physician when there is the least indication of illness. For any illness the child is sent home to the family physician; if not attended to there, he may be attended to by the inspectors. The question of time of study and study

at home is also considered. Besides this, an oculist makes it his duty to look after every child's eyes. In North Carolina the work of medical supervision advocated here has been in operation for the last three years, and it is working almost perfectly. This year there has not been a case of typhoid fever, diphtheria or other infectious disease in the schools. People are becoming educated to the needs of sanitary individual health regulation in schools. In Asheville, schools are being built on modern lines, adapted to the needs of the times and within the principles of sanitation advocated in the Section. And all that is done under the supervision of three physicians and a sanitary engineer.

Dr. Liston H. Montgomery, Chicago, said that in Chicago there is a board of education, composed of supposed non-politicians, women, ministers and lawyers, as well as politicians, with occasionally a physician, but it is supposed to be a non-political body. According to the law, each child shall attend school up to the age of 14 years, beginning at 5 or 6 years and attending, perhaps, the kindergarten first, and he is not supposed to be employed by any firm until the age of 14 has been reached, whether the child be a girl or a boy.

Dr. Richard Cole Newton, Montclair, N. J., said that a great deal is being done in all directions in the matter of the physical care of school children, but the medical profession as a body has not shown that absorbing interest in the question that they ought to show and which he thinks they will have to show. We must have medical experts in education. Such questions must be solved as to how much physical exercise is to be allowed, at what age it should begin, and what the dangers are, if any, that may complicate physical exercise in young children. That will be an important part of the duty of the physical expert who shall have charge of this branch of education. Without such experts many of these problems can not be solved. Dr. Newton said that he knows what Dr. Knopf said about the immense interest taken in the public schools by all sorts of societies to be true, but before the problems come to a final solution they must be studied carefully by a special body of experts. When such a body shall have been established an enormous advance in civilization will have been made.

THE STATE CONTROL OF INLAND WATERS.*

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MINNEAPOLIS.

The desirability of state control over inland waters, I am sure, will be recognized by every careful thinker as an absolute necessity. Of course there are some selfish individuals who wish to use a waterway for their own convenience, urging that streams are Nature's sewers. But even these individuals run to cover when their personal comfort is jeopardized by their neighbors following out this line of argument.

For many years England permitted the pollution of streams, but a time came when such conditions were beyond endurance. It then cost millions of pounds to remedy the evil. The older states in our own country tolerated stream pollution until conditions became unbearable, and then, following in the steps of England, undertook to remedy an evil which never should have been permitted to exist. The newer states seem to be following in the footsteps of the older countries so far as these evils are concerned. In my state, Minnesota, it is by no means uncommon to hear people argue that the proper place for sewage is in streams, and this argument is too often advanced by medical men who should know better. There are lawmakers even in Minnesota, and I presume in other states, who, considering their own selfish interests and the selfish interests of their constituents, use their legislative authority to prevent the passage of laws looking to the protection of streams, lakes, etc., from pollution. These selfish individuals represent a class of people who are interested in the present rather than the future; who care nothing for posterity; who will not stop to consider that a dollar well spent now may save an expenditure of hundreds of dollars later. Unfortunately the world at large is governed by selfishness, and legislators are often no exception to this rule.

If there is no state control of inland waters we have as a result a general pollution of such waters as the population of a district increases. Such pollution may result from the discharge of domestic sewage or of industrial waste, and may become a nuisance or a cause of disease. It is a remarkable fact that a cause of disease among human beings will be tolerated much longer than a nuisance which is offensive or a cause of disease among animals which results in a direct financial loss to their owners. This is demonstrable, for all of us realize that a known infected public water supply may be continued in use indefinitely by a municipality or company. On the other hand, an intolerable stench, which in no sense need be injurious to health, calls forth protests that will result in its suppression regardless of cost. The farmer who thinks that his cattle are suffering as the result of drinking impure water will, by injunction, promptly restrain the offending parties from further endangering the lives of his stock.

It would seem that the short-sighted policy of the past in the older countries, in dealing with stream pollution would be so evident to all concerned as to call forth vigorous efforts on the part of interested parties to pursue a wiser course from this time on. It is not a difficult problem to care for sewage properly. Its discharge without purification into streams or other bodies of water is simply an evidence of shiftlessness.

If there is to be state control of inland waters the question is at once raised as to whom should have charge of such matters. Bearing on this point I wish to quote extensively from an editorial in the *Engineering News*, March 29, 1906, as follows:

The proposal for a joint metropolitan sewerage commission for New York and New Jersey, made by the New York Bay Pollution Commission, and the conference on the pollution of the Delaware river held by representatives of the states of New Jersey and Pennsylvania, resulting in a proposal for joint action by those two states and by New York to prevent the pollution of the Delaware, suggest a brief consideration of the governmental machinery already existing in the several states to deal with questions of water pollution.

New York now has a State Department of Health, a State Water Supply Commission (both of which are permanent), and for two years past there has been in existence the New York Bay Pollution Commission.

New Jersey has a State Board of Health, a State Sewerage Commission, and a Passaic Valley Sewerage Commission, each of which is a permanent body.

Pennsylvania has a State Department of Health and a State Water Supply Commission.

The question naturally arises whether this machinery is not more than adequate to deal with water pollution questions. By saying "more than adequate" we mean to suggest that it might be far better to consolidate some of the existing commissions in the several states rather than to provide a new one, and after such consolidation was effected to refer all matters of interstate pollution to the single strong commission that might be hoped for in each state, thus securing such joint action as might be necessary.

The proposal recently made by the New York Bay Pollution Commission does not presuppose the creation of any new body,

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

of necessity, in New Jersey; but it does contemplate the continuation of a third commission in New York state. Is this necessary or desirable? There may be local conditions in each of the states named requiring the three separate commissions in New York and New Jersey, and the two commissions in Pennsylvania, but on broad general grounds a reduction in number is certainly desirable.

In Massachusetts nearly all the matters entrusted to the several commissions noted above have been most successfully handled by the State Board of Health. We think that in the case of New York and New Jersey, at least, it would have been better to have strengthened the state health departments rather than to have created one, at least, of the additional commissions. There were, however, some special reasons for the course pursued. In New Jersey there was some justification for establishing the Passaic Valley Sewerage Commission, on account of the fact that large construction work was necessary in the Passaic valley. It might have been well, however, to have deferred the appointment of a commission for construction work until the problem of final disposal had been more thoroughly worked out. As matters stand, the New Jersey State Sewerage Commission have been costing the people of New Jersey some $20,000 a year or more, and thus far have accomplished comparatively little. A small part of this sum entrusted to a properly organized and equipped state board of health each year, it seems to us, might have yielded far better and more permanent results. There was much to justify the creation of a separate commission for the study of the pollution of New York Bay, but in this case, also, assuming a properly organized and equipped state board of health, it is questionable whether the work might not better have been entrusted to the latter. The state water supply commissions of both New York and Pennsylvania were created in large part to deal with matters not properly pertaining to health departments. The New York commission adjusts conflicting interests between different communities seeking to draw water from the same drainage areas, and to it is also entrusted the matter of seeing that water and land interests are properly protected when a city reaches out into the rural districts for a supply. Thus far the Pennsylvania commission has seemed to do little work except to pass on applications for charters. The New York Water Supply Commission has mapped out a very ambitious program of investigation of both the water supplies and sewerage systems of the entire state. To a large extent this program covers the very field that seems naturally to pertain to the State Board of Health.

The New York State Health Department, as shown by its last annual report, is very poorly equipped for its work, owing to limited appropriations. This applies particularly to its investigations of water supply and sewerage questions. It seems fair to ask whether the State Health Department of New York is not being starved to provide funds for the other commissions. We do not suppose that this is actually the case, but the overlapping of work must make it difficult for the several commissions to secure the necessary appropriations. Certain it is that in Massachusetts, where all the sanitary work naturally falling to the State Board of Health has been continuously entrusted to such a board, highly gratifying results have been secured. In several other states where the experiment of splitting up the work has been tried long enough to see how it works, the results have been, in many respects, disappointing.

Connecticut, some will remember, launched a state sewerage commission a few years ago, but after doing some good work with a very limited appropriation it came to an untimely end. If the small sum of money appropriated to it had been given to the State Board of Health, it seems very likely that the appropriation might have been continued to the present time, and perhaps increased slightly from year to year.

About the same time that Connecticut split up its work of sanitary investigation, Ohio entrusted to its State Board of Health an investigation of the sanitary condition of the waters of the state. This work has increased from year to year, both in amount and efficiency, until Ohio is one of the leading states in the union in its supervision of public water supplies and sewage disposal. Only recently an appropriation of $15,000 has been made for an investigation by the State Board of Health on the actual workings of water and sewage purification plants within the state. Here, as in Massachusetts, concentrating sanitary investigations in the State Board of Health has worked admirably.

We are well aware that many troublesome questions are raised by the foregoing discussion, or would be if those who know the facts spoke frankly, but is it not high time that they were raised, and, if possible, settled? The questions center around the competence of certain state boards of health in the past; the degree of confidence with which their work and their personnel has inspired the public; the proper domain of a state board of health; and the persistent tendency of all governments to appoint new commissions and enact new laws instead of making the most of existing commissions and laws.

It is not necessary, I am sure, to apologize for this extensive quotation, for it is an able argument in favor of concentration of work, economy, and the greatest efficiency in matters pertaining to the protection of inland waters. Adopting this as an argument in favor of placing pollution of streams under the control of state boards of health, let us review the situation and note the present condition throughout the United States:

GEORGIA, under date of April 12, 1907, reports no laws on this subject and apparently no prospect of securing any satisfactory laws bearing on the protection of inland waters in the near future. The secretary of the State Board of Health, reporting this condition of affairs, says: "Of course I am very much opposed to the pollution of our streams in this way."

A report from FLORIDA, dated April 16, 1907, states:

> A bill now pending before the legislature, if it passes (and there seems to be a good prospect of its doing so), will give the State Board of Health ample authority to deal with such matters.

It is to be hoped that this bill passed.

Not only does NORTH DAKOTA not prevent the pollution of waters, but it actually gives permission so to do. Section 2771 of the Revised Code of 1905 says:

> Any city may empty or discharge its sewage into any river, but when a dam on such river is situated within the corporate limits of any city, the sewage shall be discharged below the dam.

IOWA has no law bearing on the protection of inland waters, but some of her citizens have protected themselves from the pollution of waters in which they were specifically interested by enjoining offenders. At different points in the state, municipalities and others have been compelled to provide sewage purification plants before discharging sewage into certain streams.

A report from VIRGINIA, dated April 15, 1907, says:

> We made a strenuous effort to secure the passage of a bill, during the last legislature, relative to the pollution of the potable waters, but met with defeat.

MICHIGAN, while one of the leading states in general matters pertaining to sanitation, has up to date no important laws bearing on the protection of waters. One of its officials, under date of April 16, 1907, says:

> This is certainly a most important question and its magnitude is impressed on us in a very striking manner when we stop and consider the deaths that result annually through causes directly traceable to polluted water.

The Revised Statutes of MAINE, as amended in 1907 (Chapter 129), state:

> Whoever knowingly and wilfully poisons, defiles or in any way corrupts the waters of any well, spring, brook, lake, pond, river or reservoir, used for domestic purposes for man or beast, or knowingly corrupts the sources of any public water supply, or the tributaries of said sources of supply in such manner as to affect the purity of the water so supplied, or

knowingly defiles such water in any manner, whether the same is frozen or not, or puts the carcass of any dead animal or other offensive material into said waters, or on the ice thereof, shall be punished by a fine not exceeding $1,000, or by imprisonment not exceeding one year.

This, if given its broadest interpretation, would seem to provide ample protection for the waters of Maine from pollution.

In MARYLAND the law prohibits the discharge of any sort of waste into any stream or other source of water supply, whereby the drinking water of any person living on that stream is fouled or rendered unfit for drinking or domestic consumption, and provides a penalty for the violation of this provision. The construction of the law is such, however, that it does not become operative until after the act of pollution has occurred and its consequences are possible of demonstration.

Many other states are in the same position as Maryland in relation to the necessity of demonstrated pollution before any action can be taken. This is certainly a most unwise and oftentimes expensive condition of affairs. It means that instead of some responsible body giving advice which can be enforced before the construction of sewerage systems or waste disposal plants, individuals or municipalities may spend considerable sums of money on such systems or plants which the state may later condemn at great financial loss to the individual or municipality.

In CALIFORNIA the responsibility of protecting the waters of the state is not placed on any board or commission. There are no direct laws bearing on the protection of inland waters, but something has been gained during the last winter looking to the protection of domestic water supplies. An official, reporting on conditions in this state, says:

I have no sympathy with the idea so often expressed that the streams are the natural sewers. In Nature people do not congregate in vast numbers on water courses or concentrate their filth to pollute them. The streams are our natural water supplies and should be kept clean. There is no doubt in my mind that both the disposal of sewage and the control of water supplies should be governed by some board. Naturally the State Board of Health is the one to be clothed with such authority, and it should be supplied with ample funds for the performance of its duties along these lines. If communities are left to themselves they will dispose of sewage in the easiest way possible, regardless of the well-being of others. My experience leads me to believe that this is a cause of a great deal of sickness. Water supplies are established that are entirely unfit for use, due consideration not having been given to the source from which the water is taken. If such matters were placed under state control I am sure that the expense involved would be repaid many fold in better health and lower death rates.

A report from COLORADO, dated April 15, 1907, says:

The law bearing on the pollution of streams is inadequate to the needs of this state. There is no legal supervision over the inland waters. Denver claims jurisdiction over the watersheds from whence it derives its supply, and this district covers territory to the extent of seventy-five miles. The only protection given is under Section 1376, Mills Annotated Statutes, Vol. 1, page 949, which reads as follows: "If any person or persons shall hereafter throw or discharge into any stream of running water, or into any ditch or flume in this state, any obnoxious substance, such as refuse matter from slaughterhouses, or privy, or slops from eating-houses or saloons, or any fleshy or vegetabe matter which is subject to decay in water, such person or persons shall on conviction thereof, be punished by a fine of not less than $100, nor more than $500, for each and every offense so committed." The same volume, page 943, states: "If any person shall obstruct or injure, or cause or procure to be obstructed . . . or shall in anywise pollute or obstruct any water course, lake, pond, marsh, or common sewer, or continue such obstruction or pollution so as to render the same offensive or unwholesome to the county, town, village, or neighborhood thereabout, every person so offending shall on conviction thereof be fined not to exceed $300, and every such nuisance may by order of the district court before whom conviction may take place, be removed and abated by the sheriff of the proper county."

In INDIANA there are two distinct laws concerning the pollution of streams, but neither of these prevents the use of streams in the disposal of sewage. An official, speaking of conditions in Indiana, says:

The discharge of sewage into streams, lakes, etc., is certainly an uncivilized act. Now that sanitary science has demonstrated safe methods for the disposal of sewage, it is almost a crime to use the streams (especially when they are small) as carriers for sewage. In Indiana this question is of the greatest importance, for with the exception of the Ohio and the Wabash rivers, all the streams are small. Four good sized cities, one of which is Indianapolis, discharge their sewage into a creek called White River. The state will be compelled, sooner or later, to take action in regard to this matter. The question is, shall we wait until loss of money, disease and death force us to act? As for state control over public water supplies, there is no doubt but that this will be necessary in the near future. It is frequently shown that municipalities have blundered greatly in securing their water supplies. Money is lost and health and life endangered simply because scientific supervision has not been provided by the state. The public sentiment in Indiana is strongly in favor of the enactment of laws regulating the discharge of sewage, the construction of sewers, and the purification and filtration of public water supplies. The health authorities all over the state, the State Engineering Society, and the State Medical Society, have spoken emphatically in favor of state control.

An official from KENTUCKY, under date of April 18, 1907, says:

The subject of the protection of inland waters presents the greatest problem that is before the sanitary authorities of the country at the present time. The magnificent work done by the State Boards of Health of Massachusetts, New York and Pennsylvania should be repeated on a larger scale by the more rapidly growing western states. It is comparatively cheap and easy to prevent the pollution of a stream, and it is enormously expensive to stop such pollution after it has been going on for many years.

An official, under date of April 15, 1907, speaking for RHODE ISLAND, says:

I believe that the State Board of Health should have complete autocratic control of all water supplies used for drinking purposes, and of all streams that are liable to be polluted with manufacturers' wastes. The installation of any plant for the purpose of obtaining a supply of drinking water and the method in handling the same, also the manner of conducting any industry which is liable to pollute streams, should be under the control of the state board.

An official, reporting for NEW HAMPSHIRE, under date of April 29, 1907, says:

A few years ago the legislature conferred on the State Board of Health authority to establish rules and regulations for the protection of public water supplies under certain conditions. The board has already prohibited the discharge of sewage into many ponds and lakes that before were unprotected. The attorney-general has rendered a decision to the effect that the board has jurisdiction over other public waters than those from which municipal supplies are taken, and under this decision we have recently protected two of our famous lakes from pollution. These facts are given simply to show that the State Board of Health has authority which is recognized. The board has an indirect authority over the construction of waterworks and sewerage systems, for it may prohibit any municipality or corporation from supplying water for public use if the quality of the water is not satisfactory to the board, or in

other words, if the source appears to be a dangerous one. The courts are authorized to issue an injunction against the use of such waters on request from the State Board of Health, thus making this law most effective. My personal views are that the discharge of sewage into streams, lakes, etc., should be prohibited, and that the filtration of public water supplies is to be recommended whenever there is danger of sewage pollution.

In MINNESOTA the law provides:

No sewage or other matters that will impair the healthfulness of water shall be deposited where it will fall or drain into any pond or stream, used as a source of water supply for domestic use. The State Board of Health shall have general charge of all springs, wells, ponds, and streams so used, and shall take all necessary and proper steps to preserve the same from such pollution as may endanger the public health. In case of violation of any of the provisions of this section, the state board may, with or without a hearing, order any person to desist from causing such pollution, and to comply with such direction of the board as it may deem proper and expedient in the premises. Such order shall be served forthwith on the person found to have violated such provisions.—R. L., 1905, Sec. 2147.

Every person who shall deposit or cast into any lake, creek, or river, wholly or partly in the state, or who shall deposit on the ice of any such lake, creek, or river, the offal from, or the dead body of any animal, shall be guilty of gross misdemeanor, and punished by a fine of not less than $100, or imprisonment in the county jail for not less than three months, nor more than six months.—Sec. 5007.

This law, so far as it goes, is excellent, but it is on the general plan of locking the door after the horse is stolen. Municipalities and individuals can ignore the advice of the State Board of Health, so far as relates to the pollution of waters, but after the pollution can be demonstrated the State Board of Health is then in position to put such offending parties to considerable expense in correcting their errors.

KANSAS seems to be coming to the front in sanitary matters. An official, under date of April 15, 1907, says:

Our last legislature passed a law looking to the preservation of the natural waters of this state. This law places the waterworks systems, as well as the sewerage systems, under the control of the State Board of Health. The new law contemplates the prevention of the discharge of untreated sewage into streams, etc., but permits sewerage systems now in operation to continue discharging into streams unless the State Board of Health deems it to the interests of the public health that such be discontinued.

NORTH CAROLINA appears to have good laws relating to the protection of water supplies. In addition it gives the State Board of Health certain authority under Chapter 214, Laws of 1893, as amended. Section 18 provides:

The said board shall from time to time consult with and advise the boards of directors of all state institutions, the authorities of cities and towns, corporations or firms already having or intending to introduce systems of water supply, drainage or sewerage, as to the most appropriate source of supply, the best practicable method of assuring the purity thereof, or disposing of their drainage or sewage, having regard to the present and prospective needs and interests of other cities, towns, corporations, or firms which may be affected thereby. All such boards of directors, authorities, corporations and firms are hereby required to give notice to said board of their intentions in the premises and to submit for its advice outlines of their proposed plans or schemes in relation to water supply and disposal of sewage, and no contract shall be entered into by any state institution, city or town, for the introduction of a system of water supply or sewage disposal until said advice shall have been received and considered.

VERMONT, under its laws of 1902, provides:

The State Board of Health shall have the general oversight and care of all waters, streams and ponds used by any cities, towns, villages or public institutions, or by any water or ice companies in this state as sources of water supply, and of all springs, streams and water courses tributary thereto. It shall have power to call for, and when it calls for it shall be provided with maps, plans and documents suitable for such purposes at the expense of such city, town, village, public institution, water or ice company, and shall keep records of all its transactions relative thereto. Said board shall have authority to prohibit any town, city, village, public institution, individual or water or ice company from using water or ice from any given source whenever in its opinion the same is so contaminated, unwholesome and impure that the use thereof endangers the public health. The court of chancery shall have jurisdiction and power, on application thereof by the State Board of Health, to enforce by proper order and decree any order, rule or regulation which said board may make under and by virtue of this section.

In WISCONSIN the law provides (Laws of 1905, Chap. 433, Sec. 3):

Before any city or village shall institute a water system, or system for water supply for the domestic use of its inhabitants, or a system of sewerage for the disposition of its sewage, such city or village shall submit to the State Board of Health the plans and specifications for such system, and both of the water system and the sewerage system, if a sewerage system exists or is proposed, and the State Board of Health shall examine such plans and specifications for the proposed system and the sanitary and hygienic features thereof; and no such system shall be installed or put in operation until the State Board of Health shall issue its certificate that such proposed system will not be in any respect insanitary or dangerous to the public health.

An official, under date of April 16, 1907, says:

Wisconsin, like many other states, is confronting a serious proposition concerning her methods in the past of obtaining water supplies for domestic purposes and the disposition of sewage. All of our lake cities have been in the habit of, and are still disposing of sewage into the same body of water from which they obtain their water supply. It is an indisputable fact that the water in all of these cities from time to time is polluted and that serious epidemics of typhoid fever and other bowel troubles result from such pollution. We must either do away with the present method of obtaining the water supply entirely from these great lakes or we must cease emptying the sewage into these bodies of water. Since the passage of the law of 1905 we allow no sewage to go untreated into any of the streams, lakes or rivers of the state. In all instances we require some system of treatment, at least the septic tank, and in some cases filtration in addition. Our conclusions in each particular are based on local conditions. We are strongly urging the necessity of pure water to begin with, rather than the purification of polluted waters.

In CONNECTICUT there is no legal supervision over the construction of waterworks and sewerage systems, although the State Board of Health is frequently called on to advise in these matters and is always ready to do so. An official, under date of April 18, 1907, states:

As the population grows more dense it becomes more and more necessary to adopt some method of sewage purification. Several cities of the state, such as Waterbury and New Britain, which formerly turned their crude sewage into the rivers nearby, have been compelled to stop the practice because of injunctions brought against them by people living below on the streams. The filtration of drinking water is also constantly becoming more and more of a necessity in this state.

In the DISTRICT OF COLUMBIA the pollution of streams by sewage is forbidden unless such pollution is sanctioned by the commissioners of the district. The right of the commissioners to sanction such pollution is limited (30 Stats. 231, Sec. 13). Applications for permission must be in writing to said commissioners and must be accompanied by detailed plans of the system

which it is proposed to construct and maintain, and no permit shall be issued until the commissioners are satisfied that such system can be maintained without nuisance or danger to the public health. Other precautions are taken to protect waters against pollution. While the protection of the waters of the district is directly under the control of the commissioners, the health officer of the district is directly responsible, so far as relates to sanitary consideration. The engineering department has the controlling voice in matters relating to structural features.

Probably the most advanced states at the present time in dealing with the protection of inland waters are Massachusetts, New Jersey, New York, Pennsylvania and Ohio. It is not necessary to spend time in discussing conditions in Massachusetts. That state has been in the forefront for years. The State Board of Health has general oversight and care of all inland waters and of all streams and ponds used by any city, town or public institution, or by any water or ice company, as sources of water supply, and of all springs, streams and water courses tributary thereto. The board may make rules and regulations to prevent the pollution and to secure the sanitary protection of all such waters as are used as sources of water supply. Such board shall consult with and advise the authorities of cities and towns and persons having, or about to have, systems of water supply, drainage or sewerage as to the most appropriate source of water supply, and the best method of assuring its purity or as to the best method of disposing of their drainage or sewage with reference to the existing and future needs of other cities, towns or persons which may be affected thereby. It shall also consult with and advise persons engaged or intending to engage in any manufacturing or other business whose drainage or sewage may tend to pollute any inland water as to the best method of preventing such pollution, and it may conduct experiments to determine the best methods of the purification or disposal of drainage or sewage. Cities, towns and persons are required to submit to said board for its advice their proposed system of water supply or of the disposal of drainage or sewage, and all petitions to the general court for authority to introduce a system of water supply, drainage or sewerage must be accompanied by a copy of the recommendation and advice of said board.

New Jersey is following closely along the lines pursued in Massachusetts. A law approved March 17, 1899 (P. L. 1899, page 73), prohibits the pollution of waters which may be used for domestic purposes and gives the State Board of Health general supervision, with reference to their purity, of all rivers, brooks, streams, lakes, ponds, wells, springs or other reservoir in this state, the waters of which are, or may be used as, the source or sources of public water supplies for domestic use, together with the waters feeding the same, etc. The same year a bill was passed establishing a State Sewerage Commission (P. L. 1899, p. 536). It is unlawful for any person, corporation or municipality to build any sewer or drain or sewerage system from which it is designed that any sewage or other harmful and deleterious matter, solid or liquid, shall flow into any of the waters of this state so as to pollute or render them impure, except under such conditions as shall be approved by the state sewerage commission. The plans of sewage disposal plants must also be submitted to the state sewerage commission in advance of their being built.

In New York the State Commissioner of Health has power to take action regarding the pollution of streams, lakes, etc., by sewage, and any changes or alterations in the sewerage systems as they existed prior to 1903 must also be submitted to said commissioner for his approval. Power is also given to make rules for the protection of watersheds when asked to do so by a municipality or by any of its citizens who are interested in any particular supply. Dr. E. H. Porter, state health commissioner, in his report to the legislature, 1906, says:

> It is very probable that during the year 1906 2,000 deaths have occurred of typhoid fever in the state of New York. As the estimated mortality of this disease is about 10 per cent., it needs no expert mathematician to figure out the distress, suffering and grief, the enormous loss—mental, physical and financial—that these thousands of cases of typhoid fever have cost. And yet we know that it is almost entirely a preventable disease. We know it to be, in great part, a water-borne disease. Two hundred and fifty epidemics of typhoid fever have been collected and analyzed in Great Britain, and in every one the pollution of the water supply was the source of the evil.
>
> The main pollution of our streams and lakes comes from the sewage of cities and towns, but to this must be added the pollution from drains, cesspools, refuse, manufacturing waste, etc. These conditions are inexcusable and shameful. They have existed for years; they should not exist another day.

The laws of New York (Chap. 661, 1893) provide that the State Board of Health shall make rules and regulations for the protection of water supplies. New York, following the example of Massachusetts, now employs a competent and increasing force of sanitary engineers.

Ohio is far in the lead of all other states west of Pittsburg in matters pertaining to the protection of inland waters. I believe it is the only state of the middle western group that has authority to compel the submittal of all plans for water and sewerage systems for approval by the State Board of Health before their construction. It is one of the leading states in the study of the purification and proper disposal of sewage. The State Board of Health in Ohio, patterning after Massachusetts, is doing excellent work in matters pertaining to the protection of its water supplies. It has in its employ a competent corps of sanitary engineers.

Pennsylvania is the most recent state in the onward march for the protection of inland waters. This state has a typhoid fever record of which it may well be ashamed. The recent epidemic at Butler seems to have inspired the legislature with a desire to improve the sanitary conditions of the state. In 1905 it not only revised its Department of Public Health, but it also passed a law "to preserve the purity of the waters of the state." Section 3 of this law states:

> No municipal corporation, private corporation, company or individual shall construct waterworks for the supply of water to the public within the state, or extend the same without a written permit, to be obtained from the commissioner of health, if, in his judgment, the proposed source of supply appears to be not prejudicial to the public health. The application for such permit must be accompanied by a certified copy of the plans and surveys for such waterworks, or extension thereof, with a description of the source from which it is proposed to derive the supply; and no additional source of supply shall subsequently be used for any such waterworks without a similar permit from the commissioner of health.

Section 5 of the same law also places the construction of sewerage systems under the control of the State Commissioner of Health.

Since Pennsylvania has awakened to its responsibilities it has created an engineering department consisting of one chief engineer, three assistant engineers and

eighteen inspectors to look after the sanitary needs of the state as relate to water and sewage.

The subject of pollution of streams was thoroughly discussed at the conference of State and Territorial Boards of Health with Surgeon General Wyman at Washington, May 23, 1906. In response to a roll call of states represented at this conference the condition in the various states is shown as follows:

Colorado—State board has control.
Delaware—State board has control.
District of Columbia—Health department has no control.
Florida—Only advisory powers.
Kansas—Only advisory powers.
Louisiana—No control.
Maine—No control.
Maryland—No control.
Massachusetts—State board has control.
Michigan—No legal control.
Minnesota—State board has control.
Missouri—No control.
Nebraska—No control.
New Jersey—State has control, but only partially under State Board of Health.
New York—State health department has control.
North Carolina—Advisory control only.
North Dakota—No control.
Ohio—State board has control.
Porto Rico—State board has control.
Rhode Island—Has control over water supplies but not over sewage disposal.
Tennessee—No control.
Utah—No control.
Vermont—State board has control.
Virginia—No control.
Washington—No control.
Wisconsin—State board has control.

From the foregoing it is to be noted that states are gradually awakening to their responsibilities in the protection of inland waters, and that almost universally the responsibility of protection is placed on state boards of health or state health commissioners. In certain instances special commissions have been abolished and the work formerly carried on by them placed under the control of state boards of health.

In states not already enumerated the only protection for waters is that given by the law which governs personal and property rights.[1] The Roman law held that rivers belong to a class of things *utilitatis innoxiæ*, and that, of natural right, flowing water is common property, that all rivers that flow perpetually are public and that property in flowing water can not be taken to belong to any one. The English common law held that while land is the subject of private property, flowing water is not. The same principles are the foundation of the American law of pollution. The existence of a remedy in the law for injuries caused by pollution of waters is guaranteed by the fundamental rule that for every injury there is a remedy. The right to an injunction and to damages on account of the discharge by cities and individuals of sewage into streams, thereby polluting them so as to render them unfit for ordinary uses, has been clearly established.

From this review of conditions in various states it will be seen that provisions for the protection of inland waters is nothing new. The question involved at the present time is whether such protection shall be through civil action or criminal prosecution. The general trend seems to be to place the protection of such waters under the control of sanitary authorities, and to anticipate in their protection rather than to wait until pollution has taken place before action is begun.

The old idea that pollution may be permitted up to a certain dilution has reference only to the creation of a nuisance and has no place in efforts to prevent the transmission of water-borne diseases. Another old idea of stream self-purification within a comparatively short distance is no longer tenable.

The protection of inland waters should be under the control of state boards of health in all states, as is now the case in Massachusetts, New York, New Jersey, Pennsylvania and Ohio. This is important both from the economic and the sanitary point of view.

1. Taken from "A Summary of the Laws Relating to Pollution of Waters of Lakes and Streams," by Rome G. Brown, attorney at law, Minneapolis. See also "A Review of the Laws Forbidding Pollution of Inland Waters in the United States," by Edwin B. Goodell, Water Supply and Irrigation Paper No. 103, U. S. Geological Survey.

DISCUSSION.

DR. HENRY D. HOLTON, Brattleboro, Vt., said that state boards of health are the proper ones to have charge of the waters of a state. In Vermont five years ago the legislature placed all the streams, lakes and bodies of water under control of the State Board of Health and gave them power to prohibit the pollution of any stream or body of water; the law provides a penalty for the placing of dead animals, or animal substances, not only in the stream and the immediate border of the stream, but in such proximity that it may be washed into or drawn into the stream. It also requires the board to exercise its authority and give its advice to towns or municipalities which are introducing water systems, and advice with regard to their sewerage systems. That law, during the last two years, prohibited, in five different towns, the use of a water supply polluted by sewage. The warning notice to three towns sufficed to make them provide pure water—or to take steps to do so. It takes time, of course. One or two towns had no authority to raise money for the purpose; and the last legislature gave them the power to bond for water purposes. So in two cases an order had to be issued prohibiting the use of the water. If that order shall not have been complied with, Dr. Holton said that the court of chancery will be asked to enjoin the towns; and then any one who uses the water after that is in contempt of court and may be fined accordingly. It seems to be working admirably; and public opinion in the state sustains the board in any action so far taken. Dr. Holton spoke of this as showing that the people are ready for action to correct the pollution. The question comes up, what rights, if any, a community or an individual has acquired in discharge of its sewage for a series of years into some stream or body of water. In Vermont it has been ruled that an individual or a community has no right to perform any act that shall be deleterious to the purity of the water or the public health of the community; that it can not acquire a right by any length of time in the doing of this wrong act in that manner. No case has yet been brought before the courts to prove that; but Dr. Holton has no doubt what the decision will be if any one should have the temerity to do so.

DR. J. H. STOLPER, Krebs, Okla., said that the suit of the State of Missouri against the city of Chicago, for emptying sewage into the Illinois River, has shown that the question of how far pollution will extend is not settled. Courts, as a general rule, are confused when it comes to questions of expert medical testimony.

Strange to say, the question of control of sanitation on railways has received little attention at the hands of the medical profession. For five years different railways have tried to have some system of sanitation, without any support from any board of health; and to-day, as far as Dr. Stolper's knowledge extends, there are only the states of Texas, Kentucky, Wisconsin (and Minnesota is falling in line) with some legal requirements in regard to railway sanitation. He thought that the matter of the spreading of infection by passenger trains should demand the attention of this Section; and he suggested that a symposium on railway sanitation be arranged next year.

COL. WILLIAM C. GORGAS, Ancon, Canal Zone, Panama, said that the water supply at Panama is entirely under the control of the commission, which can pass any law considered necessary with regard to it. The isthmus is a mountainous country, rolling, with very precipitous hills, and mountain streams come down to join the Chagres in every direction. Three or four of these streams have been dammed, so as to give a large supply, with a reservoir containing about 800,-

600,000 gallons, for the city of Panama. There is one nearly as large at Colon, also two or three smaller ones for the little villages along the canal. They seem to give a very good and a very pure supply. The disposal of night soil has been a problem. The Zone now has a population of about 100,000 people, whose sewage is, roughly speaking, disposed of about as follows: That of the city of Panama empties into the Pacific Ocean; and of Colon, into a canal that is cut through a little island and eventually gets into the sea; and along most of the towns, spoken of as camps—consisting of frame buildings, more or less temporary—various expedients for sewage disposal have been devised; but four-fifths of these camps have sewerage systems emptying into the little streams contiguous. That was allowed from the fact that the construction had been considered temporary. All these towns will, of course, be abandoned. None of said streams is used as water supply for the population.

DR. C. HAMPSON JONES, Baltimore, said that in Baltimore there had been for a number of years a struggle to maintain the purity of the water supply, which comes principally from the Gunpowder River. The pollution of this stream—to a slight degree at all events—is undoubted. Baltimore, led by the State Board of Health in the person of Dr. Fulton, attempted some years ago to get rid of certain known polluting sources. The judgment of the law and the judgment of the facts being in the hands of interested parties, it invariably resulted in defeat. The board, however, has been able to get rid of a number of nuisances, more by persuasion than by law. It seemed to him that there is nothing left but to place the power absolutely in the State Board of Health, and also to educate the people up to the point of supporting that board of health. If it is left to the question of law, with the power of a few people to turn aside the law in its action, just so long there will be trouble similar to that in Maryland.

DR. G. T. SWARTS, Providence, R. I., said that water may be polluted by waste from factories so as to become a nuisance, even if not used for drinking purposes. A nuisance ranks very high along with the question of health, and appeals very frequently to the populace and to legislatures, perhaps, more powerfully than the question of health. If a state looks out for the pollution of its own supplies or its own waterways, it will often be doing a great benefit to the neighboring state; and there is one of the difficulties that must be contended with—that while one state keeps its waterways uncontaminated, an adjoining state may be polluting its sources in such a way as to contaminate the waters of the other state which has no means of redress. There is where the U. S. Public Health and Marine-Hospital Service or some national board should have jurisdiction so as to prevent pollution.

In Rhode Island it is a difficult matter to obtain laws, owing to the conservative ideas passed down from ancestors; and to ask for the cessation of pollution from the industrial sources is to attack the industries, which, of course, are influential factors. Dr. Swarts said that they have undertaken, therefore, to meet them on their grounds by joining forces with the United States Hydrographic Bureau; and during the past nine months have combined our laboratory and chemist with the chemist of the Hydrographic Bureau to determine the amount of pollution coming from the various industries for the purpose of inducing them, by request and by cooperation, to stop that pollution; and, by taking no aggressive steps in the matter, they have had the cooperation, so far, of almost all of the industries polluting the small streams of Rhode Island. It has developed in many cases that there is a certain amount of recoverable matter from the refuse material which, in the course of a year or two, would be a source of profit to the industry. He thought that, if the Hydrographic Bureau could extend its influence or powers still further, so that other states would take advantage of it, it would be a great benefit. All interested in hygiene should urge their representatives to encourage this work of the Hydrographic Bureau, which is the cessation of the pollution of streams.

DR. WILLIAM H. SANDERS, Montgomery, Ala., said that it is hoped in Alabama to lay, very soon, the foundation for placing the control of the pollution of streams under the authority of the State Board of Health. A necessity for the creation of a national board of health lies in the pollution of streams that flow out of one state into another state or through several states. Of course, one state can only protect its streams within its own borders, and can have no authority whatever over a stream coming out of an adjoining state into it. Recently Dr. Sanders had had occasion to look into the law of nuisances. A legal book of five or six hundred pages has recently appeared which refers to a great many decisions on the pollution of streams; and very uniformly the courts have upheld the principle that no persons, corporations or what not have any right to pollute streams of water. This principle is upheld: That a man who buys property on a stream below a point at which the stream becomes polluted, although the pollution existed before he acquired the property lower down on the stream, is not by that fact prevented from bringing suit in the courts for damages although the nuisance existed at the time he acquired property and built his premises lower down. Dr. Sanders had previously supposed, that this principle would not hold; that if a man with his eyes open acquired property on the stream below the point at which it was polluted, he was estopped from making any complaint, but numerous decisions uphold the principle that health and life are superior to private and material interests.

DR. LISTON H. MONTGOMERY, Chicago, said that he would go a step farther, so as to have such supervision of the inland streams, canals, rivers and lakes, as to prevent the granting of franchises to various corporations—gas and electric light companies, railroads, manufactories, etc.—as they become careless and tend to undo this very important reform by permitting their employés to pollute streams. The Chicago water supply is derived from Lake Michigan, a few miles from the shore, and most of the sewage goes down the drainage canal into the Illinois River, and thence into the Mississippi River. Dr. Montgomery thinks that a national board of health has been already too long delayed; it is the imperative, paramount duty of our government to protect the welfare of the people in public health matters, as our government was instituted to promote the welfare of mankind. It should have the cooperation of all powers, national, state and interstate, throughout the Union.

DR. W. H. DONALDSON, Fairfield, Conn., said that those who live in manufacturing districts desire light on some practical sanitary way of disposing of factory wastes which are now such a large factor in stream pollution. How health authorities can instruct owners of large factories, located on streams, to dispose of their sewage, wash waters, dyestuffs, etc., with the intake and discharge in close proximity, is a problem separate from ordinary sewage disposal.

STREAM POLLUTION AND ITS PREVENTION.*

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The various sources of stream pollution are so well known that it is unnecessary to describe them in any considerable detail to an association like this.

The effect of stream pollution, so far as the sanitary questions involved are concerned, may be considered from two points of view: 1, the use of the stream as a source of water supply; and, 2, the influence of its condition on the health and comfort of those living in its neighborhood.

It is not the purpose of this paper to consider the pollution of streams and its prevention from the point of view of their use as sources of public water supply. While a great many cities and towns in this

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

country obtain their water supplies directly from rivers draining populated areas, the danger of the use of such sources is now well understood, and the more progressive communities have already taken steps to guard against the injury to the public health that results from the use of such sources. The use of unpurified river waters for domestic purposes is rapidly passing, and the time is probably not far distant when such use shall have wholly ceased.

On the other hand, the problem of the prevention of stream pollution from the point of view of the health and comfort of those dwelling along our rivers is one which has as yet received, on the whole, comparatively little attention in this country.

The chief sources of stream pollution are, first, domestic sewage—the wastes from water-closets, bath-tubs, sinks, etc., in dwelling houses and other buildings—and, second, manufacturing wastes—the liquid wastes resulting from processes carried on in manufacturing establishments, prominent among which may be mentioned tanneries, woolen mills, paper mills, and gas works, though there are many others.

All streams which drain populated areas are affected in a greater or less degree by the wastes of human life and industry, the effect of which may be said in general to be proportional to the density of the population within the watershed. This rule is subject to many exceptions, since it makes a great difference whether sewage is discharged into a stream directly or finds its way there only after passing through the soil. Manufacturing wastes also may greatly injure the condition of a stream affected but little by sewage, and such wastes are often the chief cause of trouble in the most seriously polluted streams.

In general, however, the rule is true, and consequently we find the worst trouble from stream pollution in densely populated regions, especially those in which a great amount of manufacturing is carried on. In this country the most serious cases of stream pollution are found in densely populated areas in the manufacturing states.

The literature of this subject is very extensive, especially in England, where the agitation for the prevention of stream pollution began some fifty years ago at a time when conditions there had reached the stage where a commission on the sewerage of towns denounced it as an "evil of national urgency requiring the earliest and most serious attention."

The agitation relative to the prevention of the pollution of streams in England was followed several years later by a similar agitation in this country, induced perhaps in part by the condition of the English streams and the realizing sense of those who had examined the subject that we were traveling rapidly in the same direction, but chiefly by the evidently increasing pollution of our own rivers, especially in Massachusetts and in densely populated watersheds in other eastern states.

An investigation of the condition of the streams of Massachusetts carried on by the State Board of Health in 1876 showed that at that time some of the streams had already become seriously polluted. No control over the streams was exercised by any one, all the waters at that time being left to the ordinary rules of common law, concerning which the board makes the following statement in its report of the year mentioned:

> Any defense against the impurities which so conveniently flow into our waters from the settlements and works on their banks has thus far been merely nominal; that is, the law can be used to prevent a nuisance from continuing to be poured into the river, but it is not used because the process is too slow, cumbersome and expensiv

Cities and towns at that time, as sewerage became necessary, discharged their sewage directly into the nearest stream or other convenient body of water with entire disregard of possible consequences, while manufacturers used the streams as they pleased.

The condition of several of the streams was rapidly becoming intolerable, and the question of dealing with the pollution of streams was taken up by the legislature and committed to a special commission authorized to employ experts, who entered on their work in 1884 and reported to the legislature in 1886.

This commission, after a thorough investigation and a consideration of various plans of controlling the inland waters of the state, recommended the appointment or designation of a commission to have a general oversight and care of the inland waters of the state, with power to advise cities and towns, manufacturers and others as to the disposal of their sewage and wastes, with a view to the protection of the public interests. Their conclusions and recommendations with reference to the duties of this proposed commission were, in part, as follows:

> Let these guardians of inland waters be charged to acquaint themselves with the actual condition of all waters within the state as respects their pollution or purity, and to inform themselves particularly as to the relation which that condition bears to the health and well-being of any part of the people of the commonwealth. Let them do away, as far as possible, with all remediable pollution, and use every means in their power to prevent further vitiation. Let them make it their business to advise and assist cities or towns desiring a supply of water or a system of sewerage. They shall put themselves at the disposal of manufacturers and others using rivers, streams or ponds, or in any way misusing them, to suggest the best means of minimizing the amount of dirt in their effluent, and to experiment on methods of reducing or avoiding pollution. They shall warn the persistent violator of all reasonable regulation in the management of water, of the consequences of his acts. In a word, it shall be their especial function to guard the public interest and the public health in its relation with water, whether pure or defiled with the ultimate hope, which must never be abandoned, that sooner or later ways may be found to redeem and preserve all the waters of the state. We propose to clothe the board with no other power than the power to examine, advise and report, except in cases of violation of the statutes. Such cases, if persisted in after notice, are to be referred to the attorney general for action. Other than this, its decisions must look for their sanction to their own intrinsic sense and soundness. Its last protest against wilful and obstinate defilement will be to the general court. To that tribunal it shall report all the facts, leaving to its supreme discretion the final disposition of such offenders. If such a board be able to commend itself by its conduct to the approval of the great court of public opinion, it will have no difficulty, we think, in materially reducing the disorders and abuses which are threatening to give great trouble in future if not speedily checked. If, however, we err in this expectation, and more drastic measures prove indispensable, the mandate of the state can always be invoked to re-enforce its advice.

The legislature, acting on the advice of the commission, in 1886, passed a law embodying practically these conclusions, and committed its enforcement to the State Board of Health, reorganized for the purpose, and two years later strengthened the law in a considerable degree by providing that all petitions to the legislature for authority to introduce a system of water supply, sewerage or drainage should be accompanied by the advice and recommendation of the State Board of Health thereon.

The same legislature that passed the first law relative

to the prevention of the pollution of streams was called on to take action relative to o· · of the streams of the state, the Blackstone river, which had already become so grossly polluted as to be a public nuisance; and a law was enacted directing the city of Worcester, within four years from the passage of the act, to purify its sewage before discharging it into the river. The four years ended in June, 1890. Five years later—that is, in 1895—the aid of the court was invoked to carry out the law, and an order was made by the court in 1896 directing the further purification of the sewage of the city. Ten years after that decision—or in 1906—the matter has again reached the courts, and a further order is asked for by those who dwell in the valley of the river and suffer from its offensive condition. Thus, after more than twenty years have elapsed since the law directing the removal of Worcester sewage from the Blackstone river was passed by the legislature, the nuisance caused by the pollution of that stream is as bad as ever.

This example of an attempt to effect the purification of a river after it has once become grossly polluted shows how slow the process may be in some cases.

Returning to the report of the commission of 1886, it will be seen that it recommended the granting of advisory rather than mandatory powers to the board that was to have charge of the protection of inland waters. This was especially essential in a state like Massachusetts, where manufacturing from the earliest years had been steadily favored by the law-making power, and the streams and unnavigable waters had been, as the commisson states in its report, substantially dedicated to manufacturing uses. The results, however, have shown the wisdom of this recommendation.

The carrying out of the work was committed to a board composed of physicians, lawyers, engineers and business men who have served without pay.

The board from the beginning examined each application for advice with reference to water supply, sewerage or sewage disposal, or other questions brought to its attention under the act, with the greatest care, with the advice and assistance of the ablest engineers, chemists and biologists obtainable, and who were not authorized to do similar work within the limits of the state. They began at once to make a systematic chemical examination of all of the various rivers at such points as would show most clearly their condition, and collected statistics as to the sources of pollution of each stream, reporting the results from time to time to the legislature.

While all cities, towns and individuals intending to introduce new systems of water supply, drainage or sewerage were required by law to submit their plans for the advice of the State Board of Health, they were not required to follow that advice. It is interesting, under the circumstances, to note that practically from the beginning none cared to let that advice pass unheeded. The advice of the board has operated in effect as an order, and one of its great advantages has been that it preceded any other action, except the preparation of plans.

In the beginning of the enforcement of the law the board found that cities, towns and factories were already discharging sewage and wastes with the greatest freedom into the rivers and other inland waters, and many of the streams of the state had already become seriously polluted.

There is no doubt that a stream or river of considerable size may receive a considerable quantity of sewage without objection if it is not used as a source of water supply, and, in carrying out the law relative to the prevention of stream pollution in Massachusetts, cases were found in which such disposal of sewage or manufacturing waste would not be objectionable, for the time being at least. Under such circumstances the disposal of sewage into streams has been advised in some cases; but such disposal has been carefully guarded by a time limit whereby the use of the stream as a place of sewage disposal might be terminated whenever it should seem necessary or desirable to do so.

Moreover, in all such cases it has been the practice to determine first the best practicable plan of purifying the sewage of the city or town before authorizing its disposal into a stream, in order that the change from the latter method of purification might be made with the least possible trouble and expense. As a further saving in the ultimate cost of sewage disposal works, the board has advised in all new systems of sewers the keeping of the sewage and storm water wholly separate, admitting to the sewers only such wastes as were liable to create offensive conditions when discharged into the streams, and keeping roof water and other surface and ground drainage wholly out of them. The insistence on the separate system of sewers has been of the greatest advantage in all cases where subsequent purification of the sewage has become necessary.

In all the laws affecting the pollution of streams in Massachusetts the legislature has made two notable exceptions, viz., the Connecticut and Merrimack rivers, the largest streams in the state, each of which receives much pollution before entering its limits. They are still, however, capable of receiving and properly disposing of a larger quantity of sewage than they now receive, and will probably continue, for the present at least, to be excluded from laws relating to the pollution of streams. In the case of the other streams, the dividing line between the condition where it is permissible to discharge sewage into the stream and the condition wherein such discharge is likely to be objectionable is, of course, uncertain, and each case has to be judged on its merits.

In general, the discharge of sewage into a stream is unlikely to be objectionable if the flow of the stream during the driest periods amounts to as much as six cubic feet per 1,000 persons in the town to be sewered. Even a smaller dilution may not be objectionable in some cases where the stream is unaffected by other wastes. On the other hand, an allowance must necessarily be made in most cases for the growth of the town and an increase in the quantity of sewage; and it is not usually desirable to allow the discharge of sewage into a stream at all unless the dilution is somewhat greater than the amount indicated. Other conditions also may have a material and perhaps a decisive influence in determining whether the sewage of a given town may be discharged into a stream or not.

The total number of inland towns in Massachusetts having sewerage systems at the present time is 60. Fourteen of these discharge their sewage directly into the Connecticut and Merrimack rivers or into tributaries of these streams at their points of confluence. Of the remaining cities and towns, twenty-five now purify their sewage and discharge only the purified effluent into the streams, while twenty-one continue to discharge their sewage into the streams without purification. Of these twenty-one cities and towns which are now discharging their sewage untreated into inland waters exclusive of the Connecticut and Merrimack rivers, about one-third are doing so under the authority of the advice of the

State Board of Health, which limits the time within which such discharge can continue, and the remaining fourteen represent the number of cities and towns whose systems were in existence previous to the passage of the law relative to the pollution of streams, and whose privilege has not since been modified.

In more recent years, while the advisory policy with reference to the control by the state over its inland waters has been continued, this policy has been materially strengthened by inserting in each new act passed by the legislature authorizing the introduction or modification of systems of water supply, drainage or sewerage, a clause requiring the approval of the plans by the State Board of Health.

As a result of the legislation of 1886 and the subsequent acts strengthening that legislation, the pollution of streams by the sewage of cities and towns has been arrested, and progress has been made in reclaiming from pollution some of the streams which had already become seriously injured at the time the act was passed. There still remain, however, several cases of serious stream pollution in Massachusetts by the sewage of cities and towns, most of which, however, are already in process of removal.

In dealing with the pollution of streams in Massachusetts one of the most serious problems presented has been that of the Neponset river, a stream which has been grossly polluted almost wholly by wastes from manufacturing processes in tanneries, paper mills, woolen mills, gas works, etc. All, or practically all, of these establishments were in existence at the time the laws relating to the pollution of streams were passed; in fact, in many cases, these manufactories had been in operation for many years.

In this case the question of preventing the nuisance caused by the stream was brought to the attention of the legislature, which directed the State Board of Health to investigate the causes and recommend measures for preventing the trouble. The question was complicated by a question of the drainage of extensive marsh lands along the stream, and the whole matter was the subject of consideration by the legislature for five successive years before action was finally taken. The law then passed did not prove strong enough to secure satisfactory results, and after four years of trial a law was finally passed requiring the purification of the manufacturing wastes by all persons discharging such wastes into the stream or any of its tributaries under penalty of a heavy fine for neglect to observe its provisions. Under this act, which was passed last year, manufacturers have quickly taken steps to prevent their wastes from creating further offense in the stream.

It is important, before closing, to call attention to one other and most essential factor in carrying out successfully the work of preventing the further pollution of streams in Massachusetts and recovering the ground which had already been lost there when this work was first undertaken, and that is the provision made by the legislature which authorized the State Board of Health to make experiments on the purification of sewage and manufacturing wastes so that the board might be in a position to advise cities, towns and manufacturers as to the most appropriate and satisfactory methods of disposal or purificaton of such wastes.

Very soon after the passage of the law an experiment station was established by the board at Lawrence, and experiments have been made there continuously for the last twenty years on the purification and disposal of sewage, and of all kinds of manufacturing wastes, beside the work done there in the purification of water and in other investigations in connection with the work of the board on this and similar subjects.

At this experiment station were made the first systematic investigations on the purification of sewage on a practical scale, the results of which have been the basis of the advice of the board in dealing with problems relating to the prevention of the pollution of streams.

The results of these experiments and investigations need not be considered here, further than to state that they have stood the test of many years in the purification of the sewage or other wastes of a large number of cities, towns and manufacturing establishments.

SEWAGE PURIFICATION BY SEPTIC TANK AND CHEMICAL PRECIPITATION.*

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The obvious impossibility of discussing in any detail either the septic tank or chemical treatment of sewage, in the twenty or thirty minutes allotted, makes it necessary that the subject be treated very generally, depending on the discussion which may follow to bring out special points of interest. Fortunately, the satisfactory account of these two methods of sewage disposal given by Professor Winslow and Mr. Phelps in No. 185 of the Water Supply and Irrigation Papers of the U. S. Geological Survey makes it unnecessary to devote any time either to the theoretical or historical side of the subject, and, therefore, the practical aspect will be the only one touched.

The two extreme views now held in this country regarding sewage disposal may be represented, on the one hand, by those who hold that all water for domestic purposes must be purified and consequently there is no need of wasting time and money on sewage; and, on the other hand, by some authorities who claim it is an absurdity to have to repurify water deliberately polluted, and that the solution of the pure-water problem lies in the most rigid and efficient purification of sewage and other wastes which by any natural means can reach a properly protected water supply. It is evident, without attempting to indicate the difficulties which must attend the proper enforcement of either of these plans alone, that for the present at least the only safe method is to purify both water and sewage whenever practicable, and the discussion in this country in legislative halls, as well as before scientific associations, regarding proper sewage disposal, would seem to indicate that to provide such a double safeguard may not be as impossible as was at once supposed.

It will probably be admitted that the question of sewage disposal is quite distinct from that of water purification both from the standpoint of the public, as well as that of the engineer and biologist. Usually when a community is forced to the sanitary consideration of its sewage problem it is for the benefit of some other town in the vicinity, and the interest can never be such a lively one as that concerned with the procuring of a pure water for local consumption. A town which would not hesitate to spend a million for pure water absolutely refuses to devote one-tenth of that amount for sewage purification. Within the last year a

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

community with which I was associated overwhelmingly voted down the proposition to borrow the $250,000.00 necessary to install an efficient and modern sewage disposal plant. This, too, in the face of threats from the state health officer and several pending suits from individuals through whose property the stream of sewage flowed. It is interesting to note that an analysis of the vote showed that the proposition was defeated not by the property owners and better class of citizens on whom the immediate cost would have fallen, but on the small renter who seemed to have the idea that the expenditure of so much money for sewage disposal would increase his rent and other living expenses.

Thus it would seem that there now exists a necessity for the perfection of methods which, while in themselves not altogether ideal, will afford some relief and to a considerable extent answer the purpose of purifying sewage. For, although there are a few shining examples of cities willing to spend the time and money necessary to find the best, we are not yet at the stage in this country where we can hope to convert the average community to this practice.

Furthermore, the efficient and economical disposition of sewage is vastly more dependent on local conditions than that of the purification of water. We certainly are not now at the place where any single method of treating sewage can be universally recommended, and, even though there might be agreement on the best theoretical means of accomplishing this purpose, the chances are that methods quite distinct must always be used to meet peculiar or even common conditions.

While most authorities on sewage disposal maintain that the problem of purification does not involve the question of a sterile effluent, there can be no doubt that the legal interpretation of what a purified sewage should be has been for the most part opposed to this view. And since, at the present time, the strongest incentive to any community to properly dispose of its sewage is the threatened damage suit of a neighboring town, some attention should be paid to the production of an effluent that will meet the requirements of the law. Certainly to the lay mind any method incapable of insuring an effluent free from disease germs would seem, to that extent at least inefficient.

The septic tank method of treating sewage is generally used in combination with one of several other processes, merely the preliminary breaking down of the organic matter being accomplished in the tank. For purposes of this discussion, however, it will probably be well to dwell more particularly on the results obtained from the septic tank alone, with only a brief reference to the subsequent treatments with which it is used in combination.

A septic tank, as you no doubt know, is simply a suitable receptacle in which raw sewage may be confined for a length of time sufficient to permit the bacteria naturally present to decompose the solid matter, as well as much that is already in solution, or comes into solution as the result of the decomposition. This time varies according to the character and age of the sewage, the temperature, etc., and may be as short as four hours or as long as forty-eight hours. Longer periods of treatment do not seem to have the beneficial effect that might be expected. The tanks may or may not be covered, they may be provided with preliminary grit chambers, and may have various automatic devices to control the flow of the sewage, but the principle involved is the same in all cases, and any condition which will permit the most active growth of the decomposing bacteria is the one most desired.

There are comparatively few places in which the septic tank with no subsequent treatment has been resorted to. Indeed, the septic tank alone can hardly be considered as a means of disposing of sewage, as the effluent will frequently come under a technical definition of sewage as truly as that which flowed into the tank. The physical character of the sewage is usually greatly improved, however, and its discharge directly into a stream is permitted under conditions which would make such a disposition of the raw sewage impossible. The chief function of the septic tank is to reduce the sludge. One properly constructed can generally be counted on to take out over 50 per cent. of the suspended solids, sometimes as high as 75 per cent. There is the greatest variation regarding the retention of the stored solids, and one objection which has been urged against the use of the septic tank has been the frequency with which it has to be cleaned. There seems to be reason for believing, however, that such an objection may not be overcome when the conditions on which the optimum efficiency of a septic tank depends are better understood. Certainly the great difference in tanks which have to be cleaned every few months as compared with those which have run for years without being emptied is not due entirely to the difference in the character of the sewage. There is probably no method which can be depended on to remove such a high percentage of the suspended solids, at such small expense, as the septic tank, particularly in the many localities in this country where neither land nor suitable sand or gravel can be obtained for some of the other processes. On the whole, however, the septic tank method alone is not one to be recommended, although, in the case of very small communities or of institutions, it may be resorted to as a stepping stone to something better. Being cheap and requiring comparatively little attention, it is more apt to be adopted than a more efficient and complete type of sewage disposal. While it is to be hoped that the septic tank alone as a means of treating sewage will not be tolerated ten years hence, we are hardly at the place where we can afford to discourage any effort which must in a short time tend to develop more satisfactory and thorough means of solving a difficult problem.

The most common method of using the septic tank is as a preliminary treatment, the effluent being subsequently passed through some sort of filter or contact bed. It does not come within the scope of my subject to discuss the various methods which have been devised for treating the effluent from the septic tank, but the fact that this is the almost universal practice emphasizes the point that septic tank treatment alone can not be considered as one properly disposing of a sewage.

In England as well as in this country the use of the septic tank, combined with some system which would permit of the action of oxidizing bacteria, has given most excellent results, and the failures seem to be due to mismanagement rather than to any fault in the method. Throughout the middle west, where conditions are not so favorable for intermittent filtration, the septic tank is most successfully combined with a contact bed, and the good results obtained would seem to indicate that the possibilities of this combination are by no means exhausted. The septic tank then may be considered as a most important and in some cases necessary preliminary method of treating sewage, which, in conjunction with a contact bed or filter, is capable under proper

management of producing an affluent which meets the requirements of many communities at the present time. It is not a sterile effluent, however, and it would appear that conditions in this country may in the future require still further treatment before a thoroughly satisfactory effluent is obtained.

One of the oldest methods of attempting to dispose of sewage is by the use of chemicals. In this country possibly 10 per cent. of those cities making an effort to treat their sewage in a sanitary manner use a chemical precipitation method. In Europe, on the other hand, chemicals are widely used, and although newer methods are being experimented with and installed, there are a considerable number of authorities who cling to chemical precipitation as being best suited to meet their special conditions.

While the number of chemical combinations and devices for using them in treating sewage are too numerous to mention, practically the only ones used on a large scale at the present time are those depending on lime, with either sulphate of alumina or sulphate of iron as precipitants. In this country sulphate of iron with lime is used almost exclusively. That a satisfactory effluent can be obtained by properly treating sewage with chemical precipitants has never been denied. By using a sufficient amount of lime and iron sulphate and allowing proper time for sedimentation the resulting effluent is usually all that could be desired. All odors and tastes are removed, and by combining the use of copper sulphate or chlorid of lime the samples taken have been found to be free from colon bacilli and all similar organisms.

The chief and most serious objection to any chemical precipitation method has been the cost. For, in addition to the original cost of the chemicals, the disposal of the resulting sludge adds considerably to the expense of the operation. In some instances the wastes may run as high as fifty tons per million gallons of sewage, although in many cases it is not more than half this amount. While it is true that a very large percentage of the sludge is water, it requires considerable time and money to get the water out, and the "press-cake" is at present of little if any value. When some one devises a profitable use for the sludge from chemical precipitation the chances are that the method will be more widely employed.

Some cities seem to be especially well adapted by natural conditions to use the chemical precipitation method of sewage disposal. Worcester, Mass., is a well-known example of a town having enough sulphate of iron from factory waste in its sewage to need only the addition of lime to form a proper coagulum. Providence, R. I., is another instance of a city using chemicals with satisfactory results, and while here it is the natural situation which makes the system so successful, there are other places in this country so situated which might do well to substitute a similar chemical precipitation plant instead of turning the raw sewage directly into the sea. There are likewise institutions and factories where the waste is of such a character as to practically necessitate a chemical treatment. The expense, of course, is large, and probably no city would be justified in spending such an amount, but the point is there exist special conditions for which chemical precipitation methods should probably always be used. Certainly the method should not be neglected at the present time simply because it is not universally adapted to all conditions in all parts of the country.

All methods of sewage purification may be said at the present time to be more or less in the experimental stage, at least when attempting to adapt them to changed local conditions. Chemical precipitation, in spite of the large amount of work done with it in the past, is being widely tested and experimented with along some new and interesting lines. What the outcome may be no one can say, but that the chemical method of sewage disposal, just as the chemical method of water purification, may not become more popular and be used more generally in those localities where it is applicable is not improbable.

Another use to which chemicals have been more recently put in connection with sewage purification, and which may not be improperly discussed here, is that of a germicide rather than a precipitant. As has been previously said, the necessity of having the effluent from a sewage disposal plant sterile, at least so far as pathogenic organism is concerned, is becoming more and more apparent, and it would seem that such a result could be best and most satisfactorily obtained by the use of certain chemicals.

At present those most frequently employed are either copper sulphate or chlorid of lime, and it would appear from results already obtained that a sterilized effluent can be readily and cheaply obtained by some such means. Of course the application of chemicals as germicides should usually be made after the sewage has been oxidized to a non-putrescible condition by any one of the methods best adapted to the local situation. Experiments have been made with lime, iron sulphate and copper which produced most satisfactory results, but it remains to be seen how general the application of such a method may become. Copper sulphate has likewise been added to sewage before it went on to the filter beds, and a great reduction in coli over the untreated sewage resulted. But it would appear that for many reasons the time to add a germicide is after the sewage is oxidized rather than before.

As was plainly pointed out by Mr. Kellerman and myself in discussing the use of copper as an algicide and germicide for water supplies, and somewhat needlessly reiterated by subsequent workers, the effect of large quantities of organic matter on copper is to throw it out of solution and thus greatly reduce its toxic property. For this reason copper hardly seems to be the germicide best suited for use in a sewage effluent. Experiments with calcium hypochlorite have shown that chlorin is not so rapidly affected by the organic matter, and consequently, in hard waters at least, is much more efficient, as well as cheaper.

Independent results obtained by experimenters in different parts of the country and with different kinds of waters indicate that by using chlorid of lime sufficient to give from one to five parts available chlorin at least 99.9 per cent. of the total bacteria in a sewage effluent can be removed and even a higher percentage of fermenting organisms.

The figures for the use of copper sulphate under similar circumstances are not nearly so good, particularly in the west where hard waters are the rule. Under such circumstances it required from five to ten parts per million to remove from 90 to 95 per cent. of the total bacteria, although in the east with soft waters Phelps was able to obtain a reduction of 94 per cent. total organisms and 98.5 of fermenting forms with one part per million of copper at a mean temperature of 50 degrees. Of course as the temperature lowers the efficiency

is reduced, and at 43 degrees it was necessary to use two parts per million to get an efficiency of 97.9 per cent. for the total organisms and 98.8 per cent. for the fermenting forms. In general, it may be safely concluded that chlorid of lime is superior to copper sulphate as a germicide for sewage effluents, both on account of efficiency and cheapness, although under special conditions, with soft water and rather high temperatures, it may be that copper would be more suitable. It is certainly more convenient to use.

To sum up, it would appear then that the septic tank, under ordinary conditions where there are no trade wastes calculated to retard bacterial action, is well suited to remove a considerable percentage of the suspended matter in sewage. It requires a small amount of space, can be cheaply operated, and the difficulty of disposing of the stored matter can probably be readily overcome. There seems to be no reason why careful attention to the time sewage is in the tank, with probably some minor changes in construction, should not enable such a system to run for years without being cleaned. The septic tank should not, however, be considered in itself a complete method of properly disposing of sewage, but should be followed by some process which will expose the effluent to further bacterial action in order that the result be what it should.

Until recently the chemical treatment of sewage, like the chemical treatment of waters, has been decidedly out of vogue in most places in this country. Within the past few years, however, interest has been revived in the method, and further investigations and improvements in treating sewage chemically may result in its being used more extensively than formerly. That it is well adapted to handle certain conditions is recognized; whether it is to have a wider application remains to be seen. If conditions change so that authorities demand a sterile as well as an oxidized effluent from sewage disposal plants it is not unlikely that it will be found that such results can be as cheaply and satisfactorily obtained by combining a germicide with chemical precipitation methods as in other ways which would have to be resorted to. In any case, it would seem that the use of chlorin or copper for sterilizing the effluent from any sewage disposal plant is likely to come into more general use.

As was said in the first place, the problem of sewage disposal is one which calls for the greatest amount of adaptation to local conditions, with no single type suitable to all. Under such circumstances we can not afford to be governed by preconceived ideas or prejudice. Wherever possible actual experiments should be conducted with all feasible methods on a large enough scale to actually determine for a given locality the best means of disposing of its sewage. If this is not possible certainly no system should be adopted until after the most careful and thorough investigation by experts uncommitted to any special type. There have been too many examples in the past of installing or rejecting a septic tank or intermittent filters or chemical treatment simply because they succeeded or failed some place else. Let us realize that the question of sanitary sewage disposal is often much more complicated than that of a pure water supply and not fail to give the matter the consideration which it deserves and demands.

Education in the Country.—The old-time notion to place colleges in the woods was correct, and the present tendency to reverse Nature and graduate a stream of blond city neurasthenics to become educated paupers is a disaster.—*Amer. Med.*

FACTORS IN THE PRODUCTION OF COAGULATION NECROSIS.*

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Coagulation necrosis is usually defined as that form of death of tissue in which the proteid suffers change similar to or identical with coagulation. It is known that this condition can be induced by various chemical substances, as acids, alkalies, and metallic salts; by some of the alkaloids; by vegetable poisons, as ricin and abrin; and by bacterial poisons. In addition to these causes it has been suggested that ferments derived from the body cells may, under certain conditions, produce similar effects as in the case of anemic infarcts of the spleen and kidney.

It seemed probable that additional information could be gained of the factors underlying coagulation necrosis by studying the factors underlying the coagulation of culture media, containing blood serum, through bacterial agencies, as well as by experiments upon animals.

A study of the factors underlying the coagulation of blood serum in the form of the well-known Hiss media through the agency of bacteria has shown that this effect is brought about by the organic acids produced in the fermentation of the carbohydrates in the media and a coagulating enzyme produced by the bacteria. The neutralization of the acid in the cultures by means of calcium carbonate (marble) inhibits the coagulation of the media, indicating that the acid is an important factor in the process.

When bacteria are cultivated in bouillon containing dextrose and afterward the cultures are filtered through a Berkefeld filter, these filtrates when added to sterile Hiss media act in a manner similar to, if not identical with, the living organisms. The filtrates induce typical clotting of the media and in this respect their action differs from the action of dilute acids of equal acidity; the dilute acids inducing merely precipitation of the albuminous constituents of the media. The action of the filtrates is also entirely inhibited on neutralization of the acids contained in them, while boiling inhibits the coagulation but does not inhibit the precipitation of the media.

From these facts it seems evident that the coagulation of the blood serum by living bacteria, or by means of culture filtrates, is induced by the combined action of the organic acids and coagulating enzymes produced by the bacteria. In fact, it was possible, by using the method suggested by Conn, to recover the coagulating enzyme from the culture filtrates and obtain identical results with solutions of these enzymes. The conclusion that I have reached on the basis of these studies is that blood serum is coagulated outside the body through the agency of bacteria by altering the electric charge of the colloids in the serum through the combined action of the organic acids and the coagulating enzymes which they produce.

In order to ascertain the influence of bacteria in producing coagulation necrosis and other alterations of the colloids in the body, two lines of experimentation were pursued: (1) The inoculation of animals with living cultures and the simultaneous administration of weak alkalies in an attempt to neutralize the acids formed by the bacteria through fermentation of the carbo-

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

hydrates in the body; and (2) the injection of filtrates of cultures of bacteria after they had grown for some time in bouillon containing carbohydrates. These filtrates were employed in their original acid condition as well as after the acidity had been carefully neutralized.

The first line of experiments, in which dilute alkalies were administered to animals after inoculation with living bacteria capable of producing coagulating and carbohydrate fermenting enzymes, yielded negative results. The animals that received the injections of dilute alkalies always died earlier than the control animals inoculated with the same bacteria.

While it has long since been demonstrated that during various infections the alkalinity of the blood is decreased, these experiments demonstrate that the method employed to overcome this effect is not efficacious. If a more appropriate means of maintaining the normal alkalinity of the blood were available it is probable that it would help to throw light upon this as well as other problems concerning infectious processes.

The second series of experiments yielded more fruitful results. The animals injected with the acid culture filtrates died, while the animals injected with equal quantities of the filtrate after neutralization of the organic acids remained alive. In each of two series of experiments made with such filtrates the neutralized filtrates were without noticeable effect. In these experiments culture filtrates of streptococcus lacticus and bacterium diphtheriæ were employed. These organisms were cultivated in bouillon, containing 1 per cent. of dextrose or some other carbohydrate, for several weeks or a month.

While it is well known that bacteria produce far less toxic solutions when grown in media containing sugar than in sugar-free media, yet the presence of the sugar does not prevent the formation of some toxin.

The fact that neutralization of the acids in the culture filtrates annuled or, at least, reduced their toxic powers materially shows that the acids in these filtrates are important factors in the production of pathologic effects. Since previous studies have shown that the organic acids and the coagulating enzymes produced by bacteria are instrumental in the coagulation of blood serum outside the body it seems probable that coagulation necrosis induced by various bacteria is due to similar causes.

As none of the animals experimented on with the neutralized culture filtrates died, it has not been possible to approach the problem from the histologic standpoint.

I have tested the influence of nearly all of the different pathogenic bacteria as to their powers of fermenting carbohydrates in the Hiss serum media and have found that all possess the property of producing a marked degree of acidity with dextrose media and many of them also coagulate the serum.

It has been demonstrated by others that the power to produce acids from carbohydrates usually runs parallel with the pathogenic influence exerted by the disease-producing bacteria. The results of the experiments with the culture filtrates likewise point to the importance of the power of fermenting carbohydrates to the pathogenic effects produced by the bacteria.

The studies which I have made indicate that (1) the coagulation of blood serum through bacterial agency is induced directly and indirectly by a coagulating and a carbohydrate fermenting enzyme produced by the bacteria; and (2) that the inhibition of the effects of the carbohydrate fermenting enzyme alone, through neutralization of the organic acids produced, will annul or materially reduce the pathogenic effects that would otherwise ensue; and (3) if some safe and certain method can be devised for overcoming this mode of offense by the bacteria we shall possess an additional defensive measure against bacterial action in the body.

THE PATHOLOGY OF MIDDLE-EAR SUPPURATION.*

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This topic involves a consideration of the essential nature of the structural and functional changes resulting from pyogenic infection of the middle ear. The limited time allotted for such purpose permits but brief discussion of such alterations and it will be my pleasure to present the varying stages of the disease as nearly as possible in the order in which they occur, considering their progress as concisely as possible.

As a foundation for the correct understanding of conditions underlying the disease, it may not be amiss to refer casually to the anatomic and histologic character of the structures to be dealt with and the provisions Nature has made to prevent or to resist purulent invasion of this organ. In the first place, it must be clearly understood that the middle ear does not mean simply the tympanic cavity. From the clinical point of view, it would probably be proper to accept the statement of Pierce, embodying the idea held by many others, that the middle ear begins at the pharyngeal end of the Eustachian tube and ends only with the most remote pneumatic cell of the temporal bone. Directly connecting channels make it possible for micro-organisms to travel throughout this entire area over the surface of a lining membrane that is histologically similar all the way, and the dependent position of many of these cellular spaces favors the retention of secretions produced as the result of microbic action. Under normal circumstances, the only exposure of the middle ear to the atmosphere is through the tympano-pharyngeal tube, which is opened only intermittently for the admission of air, but, inasmuch as this tube terminates in the nasopharynx, in a region that is more or less constantly inhabited by micro-organisms, it may be said that the middle ear is continually exposed to bacterial assault. In spite of this incessant danger the middle ear enjoys a fair degree of immunity to suppuration.

It may be accepted as proved that the middle ear is normally a sterile cavity. This immunity to infection may be partly due to ability of the mucous membrane to destroy micro-organisms, but is probably more particularly the effect of Nature's providing a mechanical guard against the entrance of germs. The epithelium lining the tympano-pharyngeal tube is of the ciliated variety and the cilia move toward the pharynx, thus obstructing the progress of invading bacteria. Add to this physiologic process the force of an outpouring secretion from the irritated mucous membrane, which naturally seeks exit by this channel, and you have a fairly efficient protective power. Should these sentinels be passed, the

* Read in the Section on Laryngology and Otology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

germs gaining entrance to the tympanum have still to do battle with the bactericidal properties of the mucous membrane and its secretion. Just how powerful a factor Nature has furnished in this respect is not determined, but reliance is probably placed mainly in the mechanical provisions spoken of. Any injury to the lining membrane of the tube or any disease which impairs the function of the cilia of that membrane favors the attacking foe. Likewise invasion by a host of bacteria, or by especially virulent micro-organisms, may overcome all protective powers and establish a local disease. The propagation and advance of the bacteria may still be checked by the bactericidal action of the vascular membrane, the blood supply throughout the middle ear being, except as regards the ossicles, excellent, and by some further mechanical barriers. An example of the latter is the blocking of the aditus ad antrum, or the obliteration of passage-ways between the cellular spaces, by inflammatory swelling of the mucous membrane. Possibly such changes not infrequently serve to resist the advance of a purulent inflammation.

It must not be supposed that all infections of the middle ear arise from the direct invasion of the tympanum by bacteria from the nasopharynx; that is, the transmission of disease from the nasopharynx to the ear is not always accomplished by its spreading over directly contiguous tissue. Some of the irritating secretion may be conveyed from the pharynx to the tympanic cavity by forcible inflation of the tympano-pharyngeal tube as the result of violent postnasal douching, Politzeration, or sneezing, and there are two other possible modes of entrance. A perforative injury to the tympanic membrane may afford the means of introducing pyogenic micro-organisms, but this is a rare accident. Hematogenous infection of the ear is a process about which we know very little except that it is possible. Metastatic abscesses may be formed here as naturally as elsewhere, and the vascular conveyance of germs, or their toxins, as a feature of certain systemic diseases, like measles and scarlet fever, is within the realm of probability. In measles the characteristic inflammatory macules have been found on the tympanic mucous membrane coincidently with their appearance in the mouth or nasopharynx, and this could not have been due to extension over the surface. In scarlatina, middle-ear complication is much more frequently a sequel to the exanthem, and as it is analogous to the post-scarlatinal nephritis, suggests the probability of its having a similar mode of origin.

Among the predisposing factors in suppurative otitis media we must consider the effect of exposure to cold. Cold winds blowing on the ear, cold water entering the external canal during the bath, sudden climatic or temperature changes, and various similar agencies are described as playing an active part. In many cases there exists an admitted passive factor in the presence of one of the well-recognized secretory diatheses. With tuberculosis, syphilis or gout as predisposing causes, or with a lowered state of local resistance, any sudden disturbance of the normal vasomotor balance within the tympanum will lead to a secretory form of inflammation of the mucous membrane.

Recognizing the important predisposing influence of acute and chronic inflammations of the nasopharynx, and also the generally accepted view of pathologists, that there can exist a purulent exudative process without the presence of pyogenic bacteria, or at least without the possibility of demonstrating their presence, it is necessary, nevertheless, to remember that such micro-organisms can be found in the secretions of the vast majority of all the patients with suppurative otitis media examined, and it would be well, in consequence of this, to look on every case of purulent otitis as bacterial in origin. Repeated attacks of rhinitis, pharyngitis or tonsillitis, or the existence of abnormal tissue developments in the nose or throat, with their attendant conditions of persistent congestion of the tympano-pharyngeal tube and the tympanum, are favorable to an infection of the middle ear. Just the conditions most conducive to the growth and activity of bacteria are obtained in this way; lowered resistance of the tissue cells and a serous pabulum in a protected chamber that is heated to the proper degree of temperature. There lurk in the throats of all persons one or more varieties of micro-organisms which are capable of doing damage whenever the other conditions requisite to bacterial infections are provided. One of the organisms most frequently discovered in this inactive state is the diplococcus of pneumonia, and it is worthy of note that this particular organism is the one most frequently isolated from the excretions of acute suppurative otitis media.

The micro-organisms that have been found in the pus from cases of suppurative middle-ear disease, and which have been considered as the cause of the condition, are almost innumerable. Most prominent in a list of such bacteria would be the following: *Diplococcus pneumoniæ, Streptococcus pyogenes, Staphylococcus pyogenes* (*albus* and *aureus*), *Bacillus pneumoniæ* (Friedlander), *B. diphtheriæ, B. tuberculosis, B. influenzæ* and *pseudo-influenzæ, B. pyogenes fœtidus* and *B. coli communis*. In acute suppurative cases the pneumococcus is isolated in pure culture much more frequently than any other organism, the streptococcus filling the second place in order of frequency and the staphylococci the third. In chronic otorrhea a pure culture of a single organism is seldom obtained; a mixed infection is the rule and the predominant germ is the staphylococcus. Such organisms as the pneumococcus and the influenza bacillus, which may have occasioned the acute outbreak, soon die out or are displaced by the secondary invasion of more robust microbes.

Whatever the morbific excitant to inflammation may be, there is always a condition of local tissue degeneration, followed by alteration in the circulation and by exudation. The first effect of a localized tissue injury is an active hyperemia of the part, on account of the dilatation of the lumen of its blood vessels, and this particular dilatation may be the result of either stimulation of the vasodilators or paralysis of the vasoconstrictors. With the increase in caliber of the vessels there is a coincident slowing of the blood current and the commencement of a pathologic exudate; as the flow diminishes in speed the solid elements of the blood, in compliance with physical laws, must leave the center of the stream and accumulate at its periphery, that is, along the walls of the blood vessels; and as these vessel walls have at the same time become changed in structure, so as to show an increased permeability, the active corpuscular elements, together with red blood corpuscles and the serous fluid, pass out through the cell interstices. These migratory white blood corpuscles, chiefly the polynuclear forms of leucocytes, the red blood corpuscles, the extravasated serum, and the degenerated and desquamated tissue cells, constitute the inflammatory exudate.

When pus-producing bacteria are at work there are especial and characteristic differences in the manufac-

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ture of the exudate from that observed in a simple irritative inflammation. Pus cells accumulate in great numbers, and instead of the deposition of fibrin, there is a tendency to liquefaction of the exudate and of the necrotic tissue, through the solvent action of the pyogenic germs. As the result of chemotaxis the leucocytes leave the blood vessels of the inflamed area to meet the invading bacterial poisons. In the ensuing struggle the leucocyte attempts to engulf and digest the microbe, and restoration to health depends largely on the ability of the host to furnish a sufficient number of these active guardsmen to overcome the invading pathogenic army. Especially virulent micro-organisms, or a too numerous collection of less dangerous ones, may rapidly destroy a mass of white cells, and it is this débris of the battle that constitutes the pus of purulent affections; the tissue cells may also take on the phagocytic action of the leucocytes. Under the microscope this yellowish white exudate is seen to consist of serum, leucocytes, often containing bacteria within their substance, and the degeneration products of dead leucocytes and tissue cells.

With the destruction of the epithelium and superficial portions of the mucous membrane a condition known as ulceration is produced, and this is probably constantly associated with suppurative otitis media; the only exception might be in the few cases of acute inflammation, of very short duration, in which the slight amount of pus that is formed makes its exit through the tympano-pharyngeal tube, or in which the active seat of purulent inflammation is rapidly transferred from the tympanum to the mastoid cells without preceding erosion of the tympanic membrane. The extent of the ulcer must vary considerably, involving in some instances but a small point on the covering of one of the ossicles, or on some part of the lining of the tympanic walls, in other cases extending over a comparatively large area of these tissues. Furthermore, the depth to which this loss of cellular substance or tissue necrosis extends in the tympanum is a matter for particular consideration. At no point is the mucous membrane covering the tympanic walls very thick, and over some portion of the ossicles it is no more than an epithelial coat over a single layer of cells that serves as a periosteum, with an insignificant amount of fibrous substance between them. Some of these thinly-covered spaces, particularly on the incus, are also especially prone to necrosis because of their poor nutrition under normal conditions—due to a limited blood supply. When deprived of the protection of its periosteal coat the bone readily succumbs to the destroyer, and necrosis of the ossicles is a common feature of prolonged suppurative tympanic inflammation.

More frequent still is the ulceration or erosion of the membrana vibrans. This portion of the external wall of the tympanum is the weakest of all and the only one that can give way before the pressure of an accumulating exudate. With the formation of any considerable amount of pus within the tympanum the intratympanic pressure on this membrane gradually increases, and as it becomes greater than the external air pressure a bulging outward of some portion of the membrane follows. Diminution of the pressure through the escape of excretions by way of the tympano-pharyngeal tube is sometimes possible, but is generally prevented by the blocking of this channel incident to swelling of its lining mucous membrane. In consequence of decreased viability of that portion of the membrane subjected to the greatest pressure from within, rendering it more liable to ulcerative perforation, spontaneous rupture of the weakened area takes place, and through this perforation the pus exudes into the external auditory canal.

With the occurrence of spontaneous perforation of the membrane, or the establishment of drainage by incision of that structure, the inflammation usually subsides, the purulent secretions flow away as rapidly as they are formed, the patient rallies sufficient forces to destroy the bacteria, and a process of repair begins. In many cases, however, this desirable result does not follow. Owing to a debilitated system, to anatomic conditions favoring the retention of purulent secretions, or to virulence of the attacking micro-organism, the suppuration continues and a chronic otorrhea is the result. A long-continued process of this sort destroys the mucous membrane and may cause necrosis of the ossicles or the bony walls of the tympanum and its communicating cavities.

Could a suppurative inflammation of the middle ear always be confined to the mucous membrane lining the tympanum, or even to the involvement of the ossicles, the disease would have no mortality and would be of interest prognostically only from the point of estimating the possible impairment of function of the sound-transmitting apparatus of the organ of hearing. Surrounded as the tympanum is, however, by organs and structures more important to life, the problem, when an inflammation breaks through the tympanic bounds, becomes a far more serious one than that concerned in the effect it may have on the hearing power. When suppurative otitis media starts on a destructive tour it may invade the mastoid process and, by an extension in one of several directions, produce mastoiditis, lateral sinus thrombosis, extradural abscess, meningitis, or cervical, cerebral or cerebellar abscess. It may perforate the internal wall of the tympanum and set up a purulent labyrinthitis, with the possibility of extension to the cerebral cavity through the internal auditory canal; it may erode the bony sheath of the facial nerve and cause paralysis of the muscles supplied by that nerve; or, through the medium of the lymphatic or venous channels, it may cause a systemic infection.

The regenerative processes observed in suppurative otitis media are extremely interesting. Wherever suppuration has taken place there is a loss of substance, and a more extensive process of repair is required to produce healing and to fill up the wound. The great destruction of tissue in the severe and chronic cases usually implies the impossibility of reparation. Small perforations of the tympanic membrane may become entirely healed; indeed, an entire new membrane may be formed, but such replacement is always by tissue which is histologically different from that destroyed, these new membranes being constructed mainly from outgrowths of the dermoid and mucous coats. Partially destroyed ossicles are never again made whole and the necrotic spots in the tympanic walls are rarely filled up by new osseous tissue. In the new-formed tissue that closes a perforation of the tympanic membrane and in the unabsorbed fibrous deposits on this membrane, calcareous concretions often appear from the deposit therein of lime salts.

As the result of Nature's effort to supply new structures to replace those removed by suppuration two serious complications of otitis media are possible: Granulation tissue, springing from some ulcerative point, may readily assume the nature of a polypoid growth, and these polyps when exuberant, by pressure on neighboring structures, or by favoring the retention of unhealthy

excretions, add to the seriousness and chronicity of the original disease. The second complication referred to is the occurrence of cholesteatomatous accumulations. Wandering epithelial cells, or the hyperplasia of cells from the dermal layer of the membrane, at the margin of perforation, or from ulcerative areas in the lining of the tympanum, lead to the development of cholesteatoma through the excessive growth of these misplaced cells. Occasionally they accrete into a tumor-like mass, producing increased damage by erosion of the surrounding tissue.

DISCUSSION.

DR. J. F. BARNHILL, Indianapolis, said that he was glad that Dr. Reik takes the position that we should regard the middle ear as a series of cavities rather than as one cavity, namely, the tympanum, which latter has so long been described as synonymous with the term middle ear. At present when we speak of the middle ear the profession understands that we mean only the little cavity in which the ossicles are found. In order that a better understanding of the causation, pathology and treatment of aural affections may be obtained, it becomes necessary that the true significance of the term "middle ear" should become better understood. It seems to him, therefore, that the Eustachian tube, tympanic cavity, mastoid antrum and mastoid cells should all be considered as integral parts of the middle ear. He thinks that, in middle ear inflammation, the chief predisposing cause lies in the nasopharynx, and very often in the adenoid hypertrophy so frequent in children. It is his very positive belief that fully 75 per cent. of all the early inflammatory aural affections begin with the above factor as a predisposing cause. In addition to this, are the various diatheses which lower the individual resistance. He thinks that the chief exciting cause is the pathologic bacteria nearly always present in the nasopharynx, which often find their way from the latter cavity into the middle ear. As to the method by which these germs reach the middle ear, there may be some difference of opinion. Dr. Reik states that they may migrate from the throat to the ear of their own accord, and that they may also be driven into the tympanic cavity by various fluids used as nasal washes, or by blowing the nose. Dr. Barnhill believes this latter method of germ entrance into the middle ear has not been accentuated as it should be; he believes that blowing the partly occluded nose has very much to do with the beginning of many of the acute forms of middle-ear inflammation. The truth of this statement can be readily understood if it is remembered that in the largest percentage, perhaps, of all cases in which middle ear inflammation arises, there is a certain amount of stoppage of the nose or nasopharynx, and that therefore a powerful blast of the nose in the effort to clear it will undoubtedly drive great numbers of bacteria into this system of cavities which we have called the middle ear. It is the duty, in his opinion, of those who have charge of cases of measles, scarlet fever or other affection in which the nose and nasopharynx are involved, to warn the individual against frequent and forcible efforts at blowing the nose.

Dr. Barnhill does not agree with the essayist's opinion that closure of the Eustachian tube by swelling may prove a means of blocking the entrance of bacteria to these aural cavities, and that such swelling is therefore the means of avoiding serious results from the entrance of bacteria. Dr. Barnhill has always taken the opposite view, that the blocking of the Eustachian tube by swelling, after the germs have been forcibly blown from the nose into the tympanum, is one of the most certain reasons for the establishment and persistence of the inflammatory state in the middle ear. This is known to be true largely by analogy. For example, the cavities of the head, or of the body anywhere, are usually free from severe inflammation so long as they have open and ample drainage. Take the urinary bladder, for instance; so long as it is drained well through the urethra, there is no inflammation, but should it become even partially blocked by an enlarged prostate, cystitis and sometimes suppuration arise. Should the antrum of Highmore become blocked by an enlarged turbinate, bacterial retention and inflammation immediately follow; and similarly it may be reasoned by analogy that when the Eustachian orifice or any part of the Eustachian tube is occluded, or any portion of the mastoid cells is blocked and therefore badly drained, the inevitable result is retention of bacteria and secretion, and subsequent inflammation. Dr. Barnhill expressed the opinion that Dr. Reik did not dwell as much as he should on the anatomic structure of the attic. Several authors have pointed out, and Dr. Dench has particularly done so in all his writings on this subject, that the attic contains the folds of the middle ear, and it is these that are capable of the greatest swelling. Dr. Barnhill believes the pressure due to the immensely swollen mucous membrane which forms these folds—a frequent occurrence in the attic as a result of an inflammatory state of the middle ear, is as much responsible for the serious ulceration and necrosis which often take place in the tympanic structures, as are the bacteria themselves. The same may be said of other parts of the ear, but the statement is particularly true of those parts containing much connective tissue, as in the upper part of the middle ear.

DR. FRANK ALLPORT, Chicago, expressed the opinion that perhaps we do not pay as much attention to the leucocyte count as we should. His attention was called to the matter more particularly by a very interesting article by Dr. McKernon of New York on the leucocyte count in acute inflammations of the middle ear and also of the mastoid. Dr. Allport thinks that we ought to grasp clearly at least the salient and significant points in regard to the leucocyte count because, while of course we can not depend on it absolutely to indicate just what is going on and what our attitude should be with regard to treatment or operation, notwithstanding it is a valuable guide post for us, provided we understand what the normal count should be, and what the variations signify. For instance, a normal leucocyte count amounts to about 8,000 by measurement. This, of course, varies, some authors regarding 6,500 as the normal count, and from that all the way up to 9,000. It must not be forgotten that the leucocyte count varies under ordinary conditions. After eating, the leucocyte count is, of course, higher than under ordinary circumstances. The higher the leucocyte count the more it indicates two points, inflammation and body resistance. Then the differential count should not be forgotten with special reference to the polymorphonuclear cells as regards their percentage. Again, authorities differ with regard to the normal percentage of the polymorphonuclear cells; some claim that about 60 per cent. is a fairly normal average and others that 65 or 70 per cent. would more clearly and closely indicate the normal percentage. However this may be, of course the higher the polymorphonuclear percentage the more the presence of sepsis and pus is indicated. For instance, as pointed out by McKernon, a high general leucocyte count will indicate a high degree of inflammation with good body resistance. If the leucocyte count ran up to 25,000 or 30,000 or more, it would indicate a reasonably high degree of inflammation with good resistance. If the polymorphonuclear count runs up also to a high percentage, to 75, 80 or 95 per cent., or even more, it indicates the presence of sepsis and pus. In other words, a high general leucocyte count with a high percentage polymorphonuclear count would indicate good resistance with a good deal of sepsis and pus, and a high polymorphonuclear count with a low degree general leucocyte count would indicate a high degree of sepsis and pus with a low degree of resistance; and a low general leucocyte count with low polymorphonuclear count would indicate that the patient was not in bad condition, or at least was improving. Of course, these features one can not depend on; they are simply guide posts that help to a diagnosis and a line of treatment.

Treatment by the Unfit.—The placing of one's body and mind in the hands of a man ignorant of what is already known of their structure and physiology is exactly comparable to asking the butcher to give a legal opinion, or the furnace man to prepare the architectural plans for a new house. Where good property and good money are concerned, people are not such fools as to run risks.—*Montreal Medical Journal.*

Special Article

FOURTH OF JULY INJURIES AND TETANUS.

For the fifth consecutive year THE JOURNAL publishes statistics regarding injuries received during the celebration of the Fourth of July, with particular reference to tetanus resulting from these injuries. There were 73 tetanus cases this year, or 16 less than in 1906, 31 less than in 1905, 32 less than in 1904 and 342 less than in 1903. There has been a constant decrease since we began to publish these statistics. It is interesting, if not significant, to note the corresponding decrease in the number of injuries due to blank cartridges (see Table 5).

In the preparation of these statistics the same methods have been employed as heretofore in order that any comparisons may be drawn fairly. The list of tetanus cases is as follows:

TABLE 1.

Name.	Age.	Cause of Wound.	Site of Wound.	Duration in days.	Result.
ARIZONA.					
Daun	40	Gunshot.	Leg.	12	D.
CALIFORNIA.					
Birmess	26	Gunshot.	....	10	D.
CONNECTICUT.					
Jordan	12	Blank cartridge.	Hand.	..	..
Zachariesen	11	Blank cartridge.	Hand.	14	D.
Parshall	25	Blank cartridge.	Finger.	16	D.
Terney	..	Blank cartridge.	Hand.	7	D.
DELAWARE.					
Myers, R.	11	Firecracker.	Hand.	9	D.
GEORGIA.					
Hulsey	13	Blank cartridge.	Hand.	12	D.
ILLINOIS.					
Driver	15	Blank cartridge.	Hand.	10	D.
Margworth	8	Blank cartridge.	Hand.	10	D.
Mason	14	Blank cartridge.	Hand.	8	D.
Pietron	25	Gunshot.	Hand.	9	D.
Williams	14	Blank cartridge.	Hand.	10	D.
Langneid	15	Gunshot.	Hand.	9	D.
Mehringer	12	Blank cartridge.	Hand.	7	D.
Hotchkiss	12	Blank cartridge.	Hand.	8	D.
Davis	10	Fireworks.	Hand.	9	D.
Faulkner	13	Blank cartridge.	Hand.	11	D.
Poor	12	Blank cartridge.	Hand.	11	D.
Gant	10	Blank cartridge.	Hand.	15	D.
INDIANA.					
Flowers	12	Blank cartridge.	Hand.	6	D.
Hurtsell	11	Firecracker.	....	7	D.
IOWA.					
Morrison	13	Blank cartridge.	Hand.	17	D.
Fritz	9	Blank cartridge.	Mouth.	12	D.
Woodmansee	21	Cannon.	Hand.	9	D.
Kaschewski	12	Blank cartridge.	Hand.	12	D.
KANSAS.					
Ryan	10	Firecracker.	Leg.	10	D.
Swetlick	16	Cannon.	....	9	D.
MASSACHUSETTS.					
Moran	18	Cannon.	Hip.	12	D.
Johnson	..	Cannon.	Arm.	14	D.
MICHIGAN.					
Haru	Adult	Blank cartridge.	Hand.	..	..
Beck	9	Firecracker.	Hand.	12	D.
Kowalski	..	Blank cartridge.	Hand.	6	D.
Summers	14	Blank cartridge.	Hand.	5	D.
MINNESOTA.					
Johnson	16	Blank cartridge.	Hand.	6	D.
Janda	12	Blank cartridge.	Finger.	..	..
MISSOURI.					
Pavalat	12	Blank cartridge.	Hand.	..	..
MONTANA.					
Dunleavy	16	Blank cartridge.	Hand.	6	D.
NEW JERSEY.					
Driece	17	Powder.	Face.	..	..
Shryver	45	Giant cracker.	Hand.	14	D.
Griffin	12	Blank cartridge.	Hand.	..	..
Burke	15	Cannon.	Hand.	13	D.
Pilewski	29	Blank cartridge.	Hand.	30	R.
Marino	14	Blank cartridge.	Hand.	7	D.
Calloway	29	Blank cartridge.	Face.	13	D.
Meyer, L.	11	Blank cartridge.	Hand.	9	D.
NEW YORK.					
Abbey	11	Blank cartridge.	....	9	D.
Baumeister	..	Giant cracker.	Thumb.	..	..
Wilder	13	Blank cartridge.	Hand.	9	D.
Moran	16	Cannon.	Hip.	12	D.
OHIO.					
Picone	11	Blank cartridge.	Hand.	6	D.
Moses	Adult	Giant cracker.	Hand.	..	..
Davis	65	Giant cracker.	Hand.	13	D.
Justice	13	Blank cartridge.	Hand.	7	D.
Maus	18	Blank cartridge.	Hand.	8	D.
Sonnenberg	..	Blank cartridge.	Hand.	12	D.
OREGON.					
Sauer	15	Blank cartridge.	Hand.	8	D.
PENNSYLVANIA.					
Frost	11	Blank cartridge.	....	9	D.
Burkhardt	45	Blank cartridge.	Leg.	6	D.
Mintzner	41	Blank cartridge.	Hand.	9	D.
Wilde	22	Blank cartridge.	Hand.	24	D.
Martin	21	Blank cartridge.	Hand.	8	D.
Matthews	6	Powder.	Foot.	30	R.
Shonk	13	Blank cartridge.	Hand.	8	D.
TEXAS.					
Quick	12	Blank cartridge.	Hand.	..	..
Amman	28	Blank cartridge.	....	..	D.
VERMONT.					
Towne	19	Blank cartridge.	Hand.	10	D.
Campbell	17	Blank cartridge.	Hand.	11	D.
WASHINGTON.					
Hemphill	13	Blank cartridge.	Hand.	7	D.
Michaelson	12	Blank cartridge.	Hand.	9	D.
WISCONSIN.					
Witt	13	Blank cartridge.	Hand.	7	D.
Burke	10	Blank cartridge.	Hand.	9	D.
Popp	11	Blank cartridge.	Hand.	11	D.

Tetanus cases occurred in 23 different states, or in two less than last year, but in the same number of states as in 1905. Tetanus occurred in 21 states in 1904 and in 30 states in 1903. Illinois had the largest number this year, 12 cases being reported. New Jersey comes next, with 8 cases, Pennsylvania comes third with 7 cases and Ohio fourth with 6 cases. Nine states have more cases this year than last, and six states have the same number as last year. Connecticut had 4 this year where it had none last year, and Pennsylvania had 2 more cases than in 1906. Table 2 gives a comparison of the number of cases in each state for the five years.

TABLE 2.

	1903.	1904.	1905.	1906.	1907.
Alabama	..	..	1	..	..
Arizona	..	..	..	..	1
California	2	4	4	3	1
Colorado	4	..	1	..	..
Connecticut	3	..	3	..	4
Delaware	..	..	1	1	1
District of Columbia	1	..	..	..	..
Florida	..	..	..	..	..
Georgia	..	..	..	..	1
Idaho	1	..	..	..	..
Illinois	49	15	20	16	12
Indiana	11	6	3	8	3
Indian Territory	1	..	..	..	..
Iowa	14	2	3	4	4
Kansas	11	1	..	..	2
Kentucky	4	2	..	1	..
Louisiana	..	..	..	..	..
Maine	2	4	1	1	..
Maryland	1	..	1	1	..
Massachusetts	16	5	7	3	2
Michigan	29	7	9	4	4
Minnesota	15	2	2	2	2
Missouri	29	1	3	3	1
Montana	2	1	1	..	1
Nebraska	4	3	3	1	..
New Hampshire	2	..	..	1	..
New Jersey	8	9	3	10	8
New York	36	9	6	8	4
North Dakota	..	..	..	..	..
Ohio	67	9	5	7	6
Oklahoma	..	..	1	1	..
Oregon	2	..	..	1	1
Pennsylvania	82	17	12	5	7
Rhode Island	3	..	..	1	..
South Carolina	..	..	..	..	..
South Dakota	..	..	..	..	..
Tennessee	..	..	..	..	2
Texas	..	..	..	..	2
Utah	2	1	1	..	..
Vermont	3	2	..	2	2
Washington	2	1	..	..	2
West Virginia	3	..	..	2	..
Wisconsin	10	4	13	2	3
Wyoming	..	..	..	1	..
Total	415	105	104	89	73
No states having cases	30	21	23	25	23

Blank cartridges are still responsible for the great majority of cases, 52, or 71 per cent. of all cases this

TABLE 5.—SUMMARY BY STATES OF JULY FOURTH CASUALTIES.

State.	Deaths.			Injuries.						Total Persons Injured.	Causes of Tetanus Cases.		Causes of All Cases Aside from Tetanus Cases.				
	From Tetanus.	From Other Causes.	Total.	Loss of Sight.	Loss of One Eye.	Loss of Legs, Arms or Hands.	Loss of Fingers, One or More.	Other Injuries.	Total Non-fatal Injuries.		Blank Cartridge.	All Other Causes.	Blank Cartridge.	Fire Crackers.	Cannon.	Firearms.	Powder and Fireworks.
Alabama	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	1
Arizona	1	..	1	..	..	..	..	1	1	2	..	1	..	..	..	..	..
Arkansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
California	1	3	4	..	3	..	11	103	117	121	..	1	4	46	8	6	58
Colorado	..	..	..	..	..	3	..	22	25	25	..	..	3	5	3	4	10
Connecticut	3	3	6	..	1	5	..	50	57	63	4	..	8	26	6	5	14
Delaware	1	..	1	..	..	..	..	15	15	16	..	1	..	9	1	..	5
District of Columbia	..	..	..	..	..	1	..	11	12	12	..	..	..	10	..	1	1
Florida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	1	..	1	..	..	..	..	1	1	2	1	..	..	..	..	..	..
Idaho	..	1	1	..	..	..	..	3	3	4	..	..	..	..	..	..	4
Illinois	12	17	29	..	11	4	28	366	479	508	9	3	75	176	28	52	125
Indiana	2	5	7	2	3	4	10	157	176	183	1	1	13	75	19	14	60
Indian Territory	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Iowa	4	5	9	1	3	2	12	204	222	231	3	1	15	102	7	4	83
Kansas	2	2	4	1	..	1	1	57	60	64	..	2	10	28	5	3	16
Kentucky	..	..	..	..	..	..	2	16	18	18	..	..	5	4	1	4	4
Louisiana	..	..	..	..	..	..	..	8	8	8	..	..	2	1	..	2	3
Maine	..	2	2	..	1	..	1	7	9	11	..	..	2	6	..	3	..
Maryland	..	1	1	..	1	2	1	18	22	23	..	..	2	10	1	1	9
Massachusetts	2	3	5	..	4	1	9	149	163	168	..	2	16	54	11	6	79
Michigan	3	3	6	2	7	5	13	130	157	163	2	1	3	75	15	10	50
Minnesota	..	1	1	..	3	3	3	85	94	95	2	..	4	57	3	10	21
Mississippi	..	2	2	..	..	..	..	..	..	2	..	..	..	..	..	..	2
Missouri	..	5	5	..	3	2	14	275	294	299	1	..	84	83	5	30	96
Montana	1	..	1	..	1	..	1	3	5	6	1	..	..	3	..	..	2
Nebraska	..	..	..	1	2	..	2	53	58	58	..	..	3	19	1	7	28
Nevada	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	1
New Hampshire	..	..	..	..	..	3	10	13	26	13	..	..	..	5	..	2	6
New Jersey	5	1	6	..	6	6	24	360	396	402	5	3	69	135	38	46	106
New Mexico	..	1	1	..	..	..	..	6	6	6	..	..	2	1	..	3	..
New York	3	21	24	..	6	10	34	678	728	752	2	2	152	172	39	172	213
North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Dakota	..	1	1	1	..	1	..	5	7	8	..	..	..	..	..	..	..
Ohio	5	6	11	2	7	5	23	327	364	375	4	2	35	140	31	35	128
Oklahoma	..	..	..	..	..	..	..	11	11	11	..	..	4	6	..	..	1
Oregon	1	2	3	..	..	..	..	2	2	5	1	..	..	2	..	1	1
Pennsylvania	6	13	19	2	5	4	17	444	472	491	6	1	19	129	17	53	262
Rhode Island	..	..	..	..	..	..	2	37	39	39	..	..	5	13	3	6	13
South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Dakota	..	1	1	..	..	..	..	7	7	8	..	..	1	3	..	4	..
Tennessee	..	..	..	..	1	..	1	4	4	7	..	..	..	..	..	2	2
Texas	1	..	1	..	..	..	..	6	7	8	..	..	..	1	..	1	6
Utah	..	..	..	..	..	..	3	27	30	30	..	..	7	9	3	5	6
Vermont	2	..	2	..	..	..	..	16	16	18	2	..	3	8	1	1	3
Virginia	..	..	..	..	..	..	..	14	14	14	..	..	..	13	..	..	1
Washington	2	4	6	..	..	1	2	14	17	23	2	..	5	13	..	2	4
West Virginia	..	..	..	..	2	1	4	30	37	37	..	..	1	15	5	..	6
Wisconsin	3	..	3	..	5	1	8	133	147	150	3	..	6	41	16	6	78
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1907 totals	62	102	164	12	75	57	237	3808	4249	4413	52	21	554	1489	267	502	1529
1906 totals	75	83	158	22	72	56	227	4531	5308	5466	54	35	925	1650	408	532	1622
1905 totals	87	95	182	25	106	80	221	4562	4994	5176	65	39	744	1775	474	404	1673
1904 totals	91	92	183	19	61	61	208	3637	3986	4169	74	25	931	1368	508	406	1056
1903 totals	406	60	466	10	75	54	174	3670	3983	4449	363	39	1309	1152	397	236	731

TABLE 6.—TOTAL DEATHS AND ACCIDENTS BY STATES DURING FIVE YEARS.

	1903	1904	1905	1906	1907		1903	1904	1905	1906	1907
Alabama	2	7	1	2	1	Montana	5	17	40	3	6
Arizona	1	..	4	5	2	Nebraska	46	63	43	47	58
Arkansas	..	..	3	4	..	Nevada	..	1	2	..	1
California	100	138	142	96	121	New Hampshire	37	23	9	29	13
Colorado	39	44	26	23	25	New Jersey	228	204	250	308	402
Connecticut	162	133	139	169	63	New Mexico	..	..	5	1	6
Delaware	1	5	14	8	16	New York	572	549	598	681	752
District of Columbia	2	10	24	5	12	North Carolina	..	..	..	..	..
Florida	1	2	2	..	..	North Dakota	10	8	20	11	8
Georgia	..	..	..	4	2	Ohio	443	327	329	490	375
Idaho	4	4	2	3	4	Oklahoma	..	3	7	12	11
Illinois	365	433	542	508	468	Oregon	16	13	9	11	5
Indian Territory	1	..	2	2	183	Pennsylvania	523	744	721	939	491
Indiana	160	211	217	250	..	Rhode Island	64	30	11	21	39
Iowa	168	137	328	255	231	South Carolina	..	..	..	1	..
Kansas	63	88	55	61	64	South Dakota	4	10	15	5	8
Kentucky	30	72	17	21	18	Tennessee	4	1	5	6	4
Louisiana	..	2	3	7	8	Texas	2	2	4	11	7
Maine	31	32	39	15	11	Utah	23	22	25	18	30
Maryland	21	22	13	10	23	Vermont	45	14	10	14	18
Massachusetts	637	193	467	329	168	Virginia	..	11	5	8	..
Michigan	144	157	288	193	163	Washington	21	25	15	25	30
Minnesota	157	102	174	95	95	West Virginia	19	16	34	64	37
Mississippi	..	..	..	2	2	Wisconsin	190	215	230	155	150
Missouri	147	84	218	325	299	Wyoming	1	2	8	3	..

year being due to that cause, as compared with 60 per cent. last year. Giant crackers caused only 8 cases this year, compared with 17 last year, and toy cannon caused 6 cases this year where they only caused 1 case last year. Table 3 gives a comparison of the causes of tetanus cases for the five years.

TABLE 3.—CAUSES OF TETANUS CASES.

	Blank cartridge.	Giant cracker.	Cannon.	Firearms.	Powder, etc.	Total.
1903...	363	17	5	3	27	415
1904...	74	18	5	1	7	105
1905...	65	17	4	5	13	104
1906...	54	17	1	7	10	89
1907...	52	8	6	4	3	73

Besides the cases of lockjaw due directly to Fourth of July injuries, an unusually large number of other cases were reported this year, these being due to penetrating wounds from nails or splinters and to crushing injuries. There were 94 such cases reported this year as compared with 60 last year and 32 in 1905. Notwithstanding the increase in the number of these cases, the number from Fourth of July injuries has decreased. This would seem to indicate that Fourth of July injuries may have been better attended to than other injuries. The next thought would naturally be that all penetrating wounds, regardless of their cause, should have like treatment.

Besides the deaths due to tetanus, there were 102 persons who lost their lives this year because of the present idiotic method of celebrating the Fourth of July. The total number of deaths this year, therefore, including tetanus, was 164, or 6 more than last year. The annual slaughter still continues, although tetanus is becoming a less potent factor. Of the 102 deaths aside from tetanus, gunshot wounds caused 20, giant crackers caused 13, and 13 deaths were due to explosions of powder, torpedoes and dynamite. Ten deaths were due to falls or runaways caused by firecrackers. One person was drowned because a "practical joker" threw a giant cracker into a boat crowded with young people. The extremity of tolerance is reached, however, when we know that 31 persons were burned to death, the majority of these being young girls and children, whose dresses so easily catch fire. One hundred and sixty-four lives were sacrificed, therefore, in the celebration of our Nations independence!

As heretofore, all accidents not directly due to the discharge or handling of fireworks or other means of noise production on or about the Fourth of July have been omitted. Accidents which occurred in regular occupations and gunshot wounds received in brawls have likewise been omitted.

The following table shows a comparison of the causes of death other than from tetanus for the past three years:

TABLE 4.—CAUSES OF DEATHS NOT DUE TO TETANUS.

Year.	Gunshot.	Fire from fireworks.	Powder, torpedoes, etc.	Giant crackers.	Cannon.	Runaways and falls.	Other causes.	Total.
1905	37	23	6	5	7	4	13	95
1906	38	18	18	3	3	2	1	83
1907	20	31	13	13	3	10	12	102

In Table 5 will be found a summary of all injuries, including tetanus, as well as of all causes. The arrangement is by states, as heretofore, so that comparisons may be made. Beneath the totals at the bottom of the table the totals for the four previous years have been inserted for comparison. Table 6 is arranged to show a more ready comparison by states of the total accidents and deaths for the five years.

New York takes the lead this year with 752 casualties. Pennsylvania taking second place with 491. Illinois had 468 and New Jersey had 402. Altogether there were 4,413 accidents this year as compared with 5,466 last year, a decrease of 1,053.

There were 4,249 non-fatal injuries, a decrease of 1,059 below last year, when the total was 5,308. Only 12 persons were completely blinded this year, or 10 less than last year; 75 people lost one eye this year, or 3 more than last year, but 31 less than in 1905; 57 lost an arm or a hand this year, or one more than last year, and 237 persons lost one or more fingers this year, this being 10 more than last year.

The principal cause of the most mutilating wounds is by far the giant cracker. This destructive means of celebration, along with the toy pistol, should be condemned. This year 1,489 injuries, including 13 deaths and 8 cases of lockjaw, were due to the giant cracker. Firearms rank second in causing mutilating wounds, being responsible for 502 injuries and 24 deaths, including 4 cases of tetanus. Blank cartridge wounds, as a rule, are not mutilating, but for that very reason are the more dangerous, since they are more often neglected. In a certain medium-sized city, men and boys were seen to shoot deliberately at each other on the street at close range. Such reckless use of the blank cartridge pistol is appalling to one who realizes the danger lurking in the slight wounds caused by them.

If the injuries caused by firearms, by the giant cracker and by the blank cartridge pistols were limited to the individuals who use them, there would seem less reason to complain. But a large percentage of the sufferers are people who prefer other means of celebration. On the Fourth of July no crowd of people is safe from the senseless "joker" with his giant cracker. No person walking on the street is safe from the stray bullet from the revolver of some irresponsible hoodlum. A considerable number of injuries resulting in several cases of tetanus and in a few deaths were inflicted by others on persons who were engaged in more enlightened methods of enjoying their holiday.

The total results of our last "jolly celebration" of Independence Day were 164 killed and 4,249 injured, many of these being maimed for life!—Is this method of celebration really worth while?

Hygiene of the Napkin.—Dr. Szekely, in the *Klinisch-Therapeutische Wochschr.*, says that in the sanatorium at Stadtwald the question of the transmission of tuberculosis by napkins and the means for its prevention have been the subject of an investigation by Dr. E. Huhs, the resident physician. Examination of the linen closet in which the napkins had been kept for years showed absence of tubercle bacilli, but a culture from the inside of napkin rings revealed the presence of a virulent bacilli. The most suitable envelope for napkins is the folded linen recommended by Kirchener, which is dipped in a disinfectant solution before it is sent to the wash. In the sanatorium at Stadtwald each patient after eating places his folded napkin in a linen case, which is placed in its proper ring. The ring and holder bear the number of the bed which the patient occupies. Each week the used napkins with their cases are placed in a disinfectant solution by which complete freedom from germs is secured. The disinfection is followed by ordinary laundering. In this way both the esthetic and hygienic requirements are fully met.

Clinical Notes

PHYSICIANS' ACCOUNTS AND RECORDS.

G. W. MOOREHOUSE, M.D.
CLEVELAND, OHIO.

That all physicians should, and that relatively few physicians do, keep clinical records of their cases is a statement that needs only to be made to be accepted. Of those who have no records, some seem perfectly satisfied with what they can remember, but many recognize that the absence of clinical memoranda is a deplorable fact, and are groping for some system adapted to their needs.

By many, cards are thought to afford the ultimate solution of the problem, and either cards or books serve very well for office records; when wanted away from the office, however, they are rarely at hand. In family practice, after an extended trial, they proved so ill-adapted to my personal needs that the suggestions here given were worked out, adopting freely whatever appealed to me in other systems.

The whole system depends on a clinical blank which combines a record of charges, credits and clinical notes, one sheet being used for each visit. By the necessity of making a change in order to keep up one's professional accounts it was thought that a distinct stimulus would be afforded to the keeping of clinical memoranda as well, and testimony to the correctness of this supposition has been afforded by their use, the most satisfactory results being secured when the records are made at the time of the visit.

The necessary supplies for the system, including a card ledger, are as follows:

1. Cards, 10 by 15 cm., ledger rulings.
2. Guides. Four sets of A to Z guides.
3. Folders. Sheets of tough but not especially stiff or bulky paper, 19 by 15 cm. in size, ruled on one side, first line 1 cm. from top of sheet, other lines about 6 to 7 mm. apart, one-fourth inch or a little more according to individual habits in writing. This sheet is to be folded to 10 by 15 cm., with rulings inside so that the bottom of the sheet reaches the top line. Both sides may be ruled if desired. One such sheet is needed for each individual patient.
4. Prescription blanks in pads of 50; if made to order they should be of the same size as the clinical blanks; they should not be larger.
5. Clinical blanks in pads of 50, size 9 by 15 cm. One of these is used for each service or payment.
6. One cover to hold one pad, each, of prescription and clinical blanks.

The heading of the clinical blank is reproduced below:

NAME ..... DATE.....
House. Office. Med. Exam. Oper. Dress. Obst. Cons. Vacc. Night.
CHARGE ..... PAYMENT.....
Patient's Residence .....
Charge to .....
Residence .....

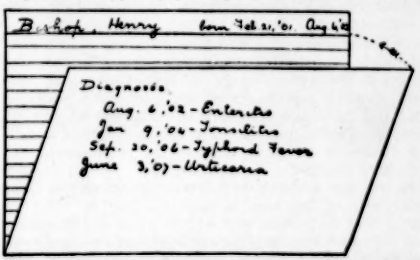
CLINICAL NOTES AND TREATMENT.

Hour ..... T..... P..... R.....

[*Here follow thirteen blank lines.*]

Since the great difficulty in private records has never been in providing for extensive notes, but, on the contrary, in getting any notes at all, I will first indicate the slightest use that can be made of the blank and the labor this involves. The first three lines of the blank must be used. On the first line the name of the patient is entered and the date; on the second a check mark through, or a circle around, the appropriate word or words, indicates the character of the service; on the third the charge to be made is entered, and the payment, if cash has been received. Credit on account without service at the time is similarly indicated by entry of name, date and amount received. The patient's residence, the one against whom the charge is to be made and his residence need rarely be indicated on these blanks, though it seemed necessary to assign a definite space to them.

The further value of the blank consists in the opportunity it affords to record symptoms, physical signs and treatment. I realize that not every one can compel himself to keep up clinical records, but the ready opportunity which these blanks constantly present to one should stimulate such records to the utmost. In the further use of the clinical blank the symptoms of the patient and the physical signs he presents having been entered, the treatment is indicated briefly but completely. Following this outline the patient's treatment is laid down (a) by advice as to regimen, etc., (b) by medicines dispensed and (c) by prescriptions written. It is not



infrequently suggested that a record of treatment be preserved in the form of carbon copies of prescriptions. This is not here advised, for two reasons: Prescriptions, even to one who dispenses no medicine, constitute only a part of the treatment, and carbons are not easy to manage, getting lost and misplaced, soiling paper and hands.

Prepared for work one has one pad of clinical blanks and one of prescription blanks in a single cover. The clinical blanks are not removed from the pad, one after another being used to record successive services rendered. A rubber band indicating the next blank to be used is a convenience.

Whether the card ledger is used or not a size corresponding to that of standard cards should be chosen for the sake of economy. One standard size is that suggested here, 10 by 15 cm. Another standard size is 4 by 6 inches. This card is a trifle larger than the former and either is about as large as can be conveniently carried. Other standard sizes are 7.5 by 12.5 and 3 by 5 inches, but clinical blanks and prescription blanks to correspond to these seem too small unless for the use of people writing a very small hand.

When it is desirable to post, take all filled pads that have been laid aside and tear out the blanks. Tear out, also, from the pad in current use to the proper date

Arrange the slips by name to correspond to the alphabetical arrangement of the ledger cards. This will make the posting much more expeditious. If any record is desired of total income, total charges, etc., before posting is the best time to make it.

Now post to ledger cards or by whatever method is used, including or not, as desired, any cash business that may have been done. There is a certain amount of work not cash to which it may not be necessary to give a ledger card, the slip or slips corresponding to this work may be placed in the folder as in filing case histories, and kept among the ledger cards until paid.

Once posted, the clinical blanks for services rendered are filed as case histories. Those showing only a record of payment on account I have thought it best to preserve as well. So far they have been kept together in a folder in chronologic order with the ledger cards.

The folder with the name of the individual, written on the top line, and containing whatever clinical blanks have accumulated, constitute what is known as the vertical system of filing. It, however, may well be used for an additional purpose, and that is as a means of recording the general medical history of the individual; name, age, social state, occupation, family history, habits, and previous history, leaving to the clinical blanks the record of special illnesses under one's charge. It seems desirable to reserve the first page of the folder (from the standpoint of its use as a vertical folder, the outside) for diagnosis and dates. This space has no other use unless for extended notes on the general history of the individual requiring more than the ruled space on the inner side of the folder.

As in the card ledger there are open and closed accounts requiring for convenience two sets of guides, so in histories two sets will be required, one for current histories and the other for those which may be considered either permanently or temporarily closed. It is inevitable that many of the folders will become overfilled in time. This may be regulated by removing the slips to an envelope of the same size as the cards, or to another folder inscribed with the name of the patient, and filing them among the closed histories. So far as possible the slips removed from the primary folder should include the records of one or more complete illnesses after the entry of their dates and diagnoses on the primary folder. In chronic cases this may often be impossible. The storage envelopes or folders should have written on them the name, diagnosis and dates included. With a system of cross-references it would be perfectly possible to have for storage purposes a diagnosis index rather than an alphabetical index.

Without the considerable outlay for furniture, demanded by some systems advertised to physicians, any one who can reach, personally or by letter, a dealer in office supplies and a printer equipped to turn out satisfactory prescription blanks may secure the necessary supplies, with or without any modification of the details. These will be the ledger cards and guides from the dealer in office supplies, from stock if standard sizes have been selected; the folders, made to order by your printer or ordered by the dealer from the makers of cards—since accuracy in size is of some importance the latter might be more satisfactory; the prescription blanks, those supplied by your druggist or made to order by the printer; the clinical blanks and cover made to order by your printer.

Probably the most convenient place to keep these records is the drawer of the office desk. With partitions to accommodate the length of the guides, trays are unnecessary. If the use of this drawer is impossible a special case of drawers will be necessary, and these are kept in great variety by the dealer in office supplies. Past notes may be consulted or carried to the bedside as a card might be, but, since it is impossible to insure that a physician doing other than an office practice will have with him at all times a complete record of every case, I have done what seemed, if theoretically second best, actually the most satisfactory thing in providing for to-day's notes.

AN ADDITION TO OUR METHODS OF DETERMINING THE OUTLINES OF THE STOMACH.

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Voluntary Associate, Pepper Clinical Laboratory.
PHILADELPHIA.

This method has reference to the determining the outlines of the stomach after the stomach tube has been passed and the viscus has been inflated with air by means of a rubber bulb. At present two procedures for determining the outlines by percussion are in use, namely, by simple percussion and by auscultatory percussion. That the former is inexact is proved by the fact that the second has been in subsequent use; at times it is difficult to determine whether a tympanitic note is due to the inflated stomach or to a distended colon. As objections to auscultatory percussion, or the ausculting with a stethoscope of the note elicited by percussion, is the fact that the note varies in intensity according to the distance from the stethoscope the organ is percussed, and that there is a boundary zone, in some cases quite wide, of uncertain tympany.

In the method about to be described the stomach is distended to a moderate tenseness with air, and the air confined by exerting compression on the rubber tube near the mouth of the patient. It is better that the tube be compressed by the fingers of the patient or of a reliable third person, but in cases in which the patient is unintelligent and no third person is at hand the doctor may himself compress the tube as indicated.

The viscus is now percussed indirectly, or, if the physician be holding the tube with one hand, directly. It will be noticed that any vibration communicated to the free walls of the stomach will be transmitted to the compressing fingers through the medium of the tube, and that when any other organ is percussed this transmission is absent.

Percussion and auscultatory percussion may, of course, be used as checks to confirm the accuracy of this observation. According to the method described, however, the line of demarcation between stomach and intestines may be determined with definiteness. Any percussion-stroke over a moderately distended colon is not transmitted, and if a colon be so distended that its walls become tense, with the possibility of transmission, such a fact is apparent on inspection of the abdomen alone. I have used this method in a limited number of cases and have found it accurate and reliable.

2134 North Eighteenth Street.

Cave Dwellers.—The modern civilized man is almost as really a cave dweller as was the cave man of prehistoric times. He shuts himself away in an air-proof, water-proof, light-proof house and wonders why he gets puny and sickly, wizened and consumptive.—*Good Health*

CONGENITAL TRANSPOSITION OF KIDNEY.

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CHICAGO.

By presenting this illustration of renal abnormality found by Dr. Charles H. Parkes, demonstrator in the Department of Operative Surgery and Anatomy at the Chicago Policlinic Laboratory, I wish to call attention to the uncertainties, even after accurate ureteral catheterization (unless *x*-ray pictures are taken with catheter *in situ* or a double exploratory incision) in surgical procedures on the kidneys. A study of this illustration, which is remarkably accurate, will show the clinical possibilities.

Due to some congenital misarrangement, the right

V, vena cava.; A, abdominal aorta; LK, left kidney; RK, right kidney; LU, left ureter; RU, right ureter; R, rectum; T, trigon of bladder; Ps, psoas muscle; LRA, left renal artery; LRV, left renal vein; RRV, right renal vein; RRA, right renal artery.

kidney is transposed to the left side. The blood vessels to this kidney, however, arise as though it were properly placed, from the normal level and side of the aorta and vena cava. The ureter enters the bladder normally at the right side of the trigon after crossing the posterior abdominal wall at the level of the fifth vertebra.

The left kidney is normally located, except that, if the generally accepted facts of the regional anatomy of the kidney placing two-thirds of the kidney above the twelfth rib are accurate, this kidney is too low. It will be noticed that the ureteral meatus in the trigon from this kidney is considerably higher than that of the right side, which condition is probably due to traction. The kidney mass on the left side showed one common fatty capsule. The fibrous capsule is also one continuous covering for both kidneys with a depression around the circumference of the mass indicating the upper limit of the right and the lower limit of the left kidney. The parenchyma is fused by fibrous connective tissue rather than being continuous in structure. The mass showed two distinct pelves with the vessels relatively distributed, as shown by illustration.

PRIMARY TYPHLITIS SIMULATING APPENDICEAL ABSCESS AND ILEOCECAL TUBERCULOSIS.

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Attending Gynecologist to Blessing Hospital.
QUINCY, ILL.

The following case is deemed worthy of a detailed report on account of the paucity of the literature regarding primary typhlitis and the consequent difficulties in diagnosis which it presents, and on account of the unusual complications in the present case. None of the works on appendicitis or on diseases of the intestines or the general works on surgery give any adequate account of this trouble. Hemmeter gives only two sources of ileocecal tumor not due to primary appendicitis, i. e., cecal tuberculosis and carcinoma of the cecum. Eisendrath in his recent work on "Surgical Diagnosis" adds a third, ileocecal actinomycosis. Dr. Clarence A. McWilliams, in a paper read before the New York Surgical Society, Feb. 27, 1907,[1] under the title "Primary Typhlitis Without Appendicitis," gives the history of a case very similar to mine in which he assumed that the cecal tumor was either tubercular or carcinomatous, and resected it. Pathologic examination showed simple inflammation and infiltration affecting all the intestinal layers adjacent to the cecum, the inflammation proceeding from within the cecum. My case is as follows:

History.—Mrs. N. S., aged 30, gave no history of previous illness except the usual diseases of childhood. She menstruated first at the age of 13 years, and then regularly up to date excepting when pregnant, the flow lasting usually four or five days. She had had three children, her labors being normal; no miscarriages. Youngest child 4 months old. She menstruated again in May, 1907, for the first time since the birth of last child, the flow lasting about thirty-six hours and being unaccompanied with pain. In January, 1907, she woke one night with severe pain in the right iliac region. This grew better in an hour or so, but her right side had since been more or less tender. I first saw the patient May 19, 1907, and learned that aside from tenderness in her right side she had been perfectly well up to the evening of May 16, when she began vomiting and developed a severe pain in the epigastrium, some fever and diarrhea. The condition continued except that the pain gradually localized itself in the right iliac fossa.

Examination.—This showed heart, lungs and pelvic organs to be normal. The area over the region of the appendix was very sensitive, but nothing further could be found out that day on account of rigid abdominal muscles. Her temperature at this time was 102.5 F. and pulse 100. She was removed to Blessing Hospital the following day and all food withheld. Her

1. Anns. of Surgery, 1907.

temperature this day was 99.8 F. and pulse 84, but her right side was just as sensitive and her bowel movements as frequent. May 21 a distinct mass could be made out by both vaginal and abdominal examination in the right iliac fossa, the temperature then being at noon 100.2 F. and at 8 p. m. 99.8 F. May 22 temperature was 100.2 F., pulse 80 at 8 p. m., and the tumor was somewhat larger. May 23 temperature was 101 F. at 4 p. m. and 101.8 at 8 p. m., and the mass was more sensitive, and suspecting appendiceal abscess, she was ordered prepared for operation the next morning. May 24, before the operation, her temperature was 101 F., pulse 98, and the mass was as large as a large sized orange.

Operation.—Ether anesthesia was used and the incision was made over the center of the mass which corresponded to the outer border of the right rectus muscles, a little lower down than midway between the anterior spine of the ilium and the umbilicus. On retracting the edges of the incision the greater omentum came into view covering the cecum and ileum, and the ileum, omentum and cecum were firmly united by adhesions. The ascending colon was also firmly adherent to the parietal peritoneum. The appendix was situated to the outer side of, and adherent to, the cecum, and was congested, thickened and distended. The appendix was ligated, removed and the stump buried by a purse-string suture. The walls of the cecum and the lower six or eight inches of the ileum were inflamed and very much thickened, the walls of the cecum averaging about three-fourths of an inch in thickness. The ileum in that region was matted down by adhesions, but no attempt was made at their separation. The extensive adhesions, the absence of pus, the very great thickening of the cecum and ileum made it probable that the tumor was an ileocecal tuberculosis.

Postoperative History.—After the operation the condition was good and she made an uneventful recovery as far as the appendectomy was concerned. The temperature never rose above 99.5 F. after the operation, and in a course of three days was normal. The stitches were removed on the ninth day, the wound having healed by first intention. Her bowels moved freely on May 28 and then once a day until June 7. June 8 she was removed to her home, and on the way there in the ambulance developed colic and vomiting. On the evening of June 8 I found her with the abdomen somewhat distended and bowels undergoing very active and visible peristaltic movements. She complained of the attacks of colic, but no pain in abdomen during the intervals of intestinal peristalsis. She vomited at that time a small quantity of mucus stained with bile. She had no bowel movement June 7 and none June 8, and was passing no flatus. I withheld all food and drink and gave hypodermically morphin sulphate, ¼ gr. and ordered enemata of soap-suds and glycerin. A diagnosis of intestinal occlusion was made at this time, but I was under the impression that it was due to the thickened walls of the ileum and cecum. I advised a return to the hospital next day, but could not get the patient's consent. On June 9, 10 and 11 the patient's condition remained practically the same, i. e., she vomited mucus and bile at frequent intervals, there was active peristalsis of the intestines without abdominal tenderness or any passage of flatus or feces. She was somewhat weaker, however, her pulse became more rapid and her temperature was subnormal. During the night of June 11 the vomitus became fecal in character and the patient consented to be removed to the hospital on the morning of June 12, and was operated on during the afternoon of that day.

Second Operation.—An incision was made somewhat above and to the outer side of the scar of the first and a few adhesions easily separated, were found under this between the parietal and visceral peritoneum. The greatly thickened condition of the walls of the ileum and cecum had disappeared and they seemed about normal. The ileum at its junction with the cecum was simply matted down by adhesions, and these were separated as well as possible. Since they were so dense and numerous that it was impossible to cover in the raw surfaces, it was thought advisable to join the ileum, where it was free from adhesions, to the lower part of the ascending colon by a lateral anastomosis. The ascending colon being bound down tightly, it could not be brought up into the abdominal wound and the Murphy button was preferable to any other method of making an intestinal anastomosis.

Subsequent History.—The patient was somewhat collapsed when removed from the operating room, but rallied promptly and her condition was good next morning. She had a thin, yellow bowel movement and expelled some flatus fifteen hours after the operation, but had no further vomiting. From this time until she was discharged from the hospital, three weeks later, she made an uneventful recovery, having no fever, no abdominal pain and regular bowel movements. At the present writing (July 20) she is at home doing her own housework and has two bowel movements daily, but no pain or discomfort anywhere. The button has not yet been passed, but a recent skiagraph shows that it is a harmless tenant of the cecum.

I was assisted by Dr. E. B. Montgomery of this city in both of these operations and in the preparation of this report.

MILK MODIFICATION PRESCRIPTION BLANK.

G. W. PUTNAM, M.D.
AURORA, ILL.

I am suggesting to those who use the percentage system of milk modification for infant feeding a prescription blank which, I think, will make the work less tedious and more accurate than it otherwise would be. These blanks should be filled out by the physician for a definite time, subject to his change if the formula used is not giving satisfaction. He should have the mother or nurse return the prescription when a new one is issued, that he may keep a record of the progress in feeding. On the back of the blank are printed the directions, informing the mother or nurse as to the method of preparing the different food units mentioned in the blank. It will be necessary to explain to the mother or nurse the technic of preparing and keeping the modified milk and the care of the utensils used, but, after these facts have been thoroughly impressed on the mother or nurse, the milk modification blanks will convey all the information needed. These blanks will be printed by any printer at a moderate cost. They should be made into the form of blocks or prescription books of a handy pocket size.

Milk Modification for Infant Feeding. **Dr. John Doe.**

From ..... 190.. to ..... 190..

Baby .....
— Per cent. Milk.....ounces.
— Per cent. Milk.....ounces.
Peptonize Milk for.....minutes.
Milk Sugar .....tablespoonfuls.
Lime Water .....ounces.
Barley Water .....ounces.
Oatmeal Water .....ounces.
Whey .....ounces.
Orange Juice .....ounces.
Meat Juice .....ounces.
Albumin Water .....ounces.
Water enough to make.....ounces.
Number of Feedings.....
Interval of Feedings.....hours.

Dr. .....

DIRECTIONS.

Percentage Milk is obtained from bottled milk delivered by milkmen. 20 per cent. milk is the upper 6 ounces, 10 per cent. the upper one-third, 7 per cent. the upper one-half, 4 per cent. all of the bottle.

Milk Sugar is obtained at the drug-store.

Lime Water is a saturated solution of unslaked lime which has been cleared by straining. The lime and water should stand twelve hours before straining.

Oatmeal Water—Boil two tablespoonfuls of oatmeal flour to the quart of water for thirty minutes, keeping the quantity of water up to a quart, and strain through muslin.

Barley Water same as oatmeal water, using barley flour.

Whey—Add one junket tablet to a pint of milk, stir and strain off the whey.

Albumin Water—White of one egg to two ounces of water.

Meat Juice—Squeeze the juice from partially broiled beefsteak.

Peptonized Milk—Add one powder to four ounces of water and one pint of milk, heat to 98 F. as long as directed, then bring it to a boil, cool and place it in the ice box.

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[For other information see second page following reading matter.]

SATURDAY, AUGUST 24, 1907.

THE ANNUAL FOURTH OF JULY SLAUGHTER.

In this issue we publish our fifth annual compilation of the results of the "celebration" of Independence Day, and while they can not be considered as in any sense a flattering tribute to our national intelligence, yet there is much satisfaction for us in the returns on tetanus mortality. When The Journal first collected statistics on this subject, in 1903, the startling number of deaths for that year was 466, and of these 406 were due to tetanus; we also found reason for believing that this number was not greatly in excess of the results of the years immediately preceding it. On the publication of these figures a general alarm was sounded throughout the country and definite methods were adopted for a more sane method of celebration, with results that were at once apparent, for the next year the number of cases of tetanus was but 105. This improvement has steadily continued, so that in 1905 there were 104 cases, in 1906 but 89, and this year the lowest number yet recorded, 73, was reached.

There can be no doubt that this decrease in tetanus is due entirely to two causes, one being a popular understanding of the grave danger that lies in blank cartridge and in other Fourth-of-July wounds, and the other is the more thorough surgical treatment of these wounds by the practicing physicians and the frequent prophylactic use of antitoxin. Assuredly, the decrease in tetanus is not due to lack of opportunity for infection, for the number of wounds received in celebrating has each year been fully as great or greater than in 1903, when there were 415 cases of tetanus. Furthermore, there has been no natural decrease in tetanus, for we are receiving more reports of tetanus from wounds not obtained in celebration than ever before. It is remarkable that while the tetanus mortality has dropped from 406 to 62, the mortality from other causes has risen from 60 to 102; if there had not been some radical change in the handling of the minor injuries of the Fourth the tetanus cases would probably have risen likewise, or at the best, the number would have remained stationary.

It would seem from these statistics that the medical profession has learned its lesson and done its part, but that the public does not care enough about the matter to insist on its own protection. Every municipality has laws prohibiting the use of firearms and large cannon crackers, but in compliance with popular sentiment they remain unenforced. Here and there some active body of citizens or some alert public official has insisted on the enforcement of the statutes, with the result of securing safety and comparative peace for the community but more frequently the laws have been honored solely in the breach.

We must class this public indifference with those other manifestations of the cheapness of human life in our country, which permits us to shock the civilized world with our frightful figures of fatalities in railroad wrecks and in industrial accidents, not to mention our peaceful submission to universally endemic typhoid, hydrophobia and other preventable diseases. Possibly these things are the results of overestimation of the importance of "personal liberty" and fear of governmental parternalism inherent in us; we leave that question to the sociologist, while we maintain that the attitude of every medical society and of every medical man should be that of active insistence that every law passed for the preservation and improvement of health must be enforced. There remains a great deal that can be done by local medical societies in this regard, and that much can be done for the improvement of the conditions on the Fourth is shown by what has been accomplished in some communities.

SANITATION AND POPULATION.

While there is frequent emphasis of the large saving of life in the last half century as the result of the development of sanitary science and the enactment and enforcement of sanitary regulations of all kinds, especially in large cities, there is an impression in many minds that not so much has been accomplished in this way for the increase of the actual living populations of civilized countries as might reasonably be expected from the claims made by enthusiastic advocates of modern scientific sanitation. The only way, of course, that the actual improvement in the situation as regards the influence of the lower death rate produced by state and city hygiene is the collation of statistics of present day populations. It is generally recognized that the birth rate in civilized countries has fallen, very decidedly as a rule, rather than increased in the last half century, and, therefore, that any increase in population must be due to a lower death rate consequent on sanitary improvements. The figures for Europe are not a little startling in this regard. We have taken millions of people from Europe during the last half century, other European millions have gone to other parts of the globe, yet the population of this geographical grand division has increased from about 250,000,000 at the middle of the nineteenth century to about 400,000,000 at the beginning of the twentieth century.

This means that on a falling birth rate and in spite of immigration and the ravages of at least two important wars—that between Austria and Germany in 1866 and between France and Germany in 1870—the popu-

lation of Europe has nearly doubled in less than two generations. Some of the details of this increase are interesting. During this period the population of Ireland has been halved in spite of a high birth rate. This, of course, is due to emigration. The increase in the population of France has been very slight because there has been an extreme reduction in the birth rate. A French family that has more than two children, in the cities especially, is so remarkable as to attract attention. In most families there is but one child. A suggestive picture of the situation is to be found in the pointed answer made in one of the French comic papers not long since: "Are you sure that she was married twice?" "Oh, yes, why she has two children!" .The decrease in the population of France continues in spite of various governmental modes of encouragement of the birth rate and in spite of the laxest kind of laws with regard to illegitimacy.

The two countries at the extreme ends of Europe which differ most in education, in political status, in civilization, in freedom and in nearly every other national quality that can be thought of—England and Russia—agree in this that their numbers have actually doubled in the somewhat less than two generations of the last half century. The causes are not the same in the two countries, but, on the contrary, are the opposite poles among the factors which bring about increase of population. Russia has a very high birth rate and England has a smaller death rate than any other country in Europe. The German population has increased wonderfully during this period, and yet not to the extent which would ordinarily be expected from our traditions of German domesticity. The authority for these figures is Professor Sombart of Berlin, who is quoted in the *American Review of Reviews* for August, so that there can be no doubt that the German figures must be considered not only as unprejudiced, but as absolutely accurate for Germany at least. What now constitutes the German Empire contained approximately 25,000,000 of inhabitants about the beginning of the nineteenth century. When the empire was formed after the war with France in 1871 the population of the imperial territory was about 40,000,000. In 1905, according to the official figures, the population in round numbers was 60,000,000. In the last generation Germany has added one-half to its total population. It is the appalling contrast of these population statistics which has led to the strenuous efforts on the part of France to abate the national misfortune which appears to be impending in the falling birth rate, and of late actual decrease in population, while her rival across the Rhine grows so fast.

Some of the statistics with regard to the racial elements in the population are likely to be of special interest to America because we have millions of various European races among our population as the result of recent immigration. The Teutonic peoples have about held their own in their proportionate number in European population during the past century. The Latins have lost the preponderance which was theirs a century ago, and now the Slav represents the most important factor in the population. The reversal of statistics in this matter is very striking. Professor Sombart says: "If Europe a hundred years ago was preponderatingly—that is, almost three-fourths—Germanic-Latin, it is today preponderatingly—likewise three-fourths—Germanic-Slavic." It is no wonder the German professor asks the very pertinent question: "And a hundred years hence what?"

Among the Slav nations there is a favorite expression: "The past of Europe belonged to the Latins, the present of Europe belongs to the Teuton, but the future of Europe belongs to the Slav." The figures that we have quoted would seem to emphasize this rather strikingly. Among our own population it is evident that the same factors will work out the same conclusions. Our sanitary regulations have reduced the death rate markedly. Education and other factors have reduced the birth rate among native Americans, and among those from western Europe generally. The birth rate among our Slav and other immigrants from eastern Europe has not yet been thus affected. The future of our population, then, is likely to resemble that of Europe to a great extent. It seems worth while to face opportunely the problems involved in this consideration and to realize what the outcome of present conditions is likely to be. Physicians almost more than any others in the population are interested in the reflections which naturally arise from the thought of our satisfyingly low death rate but rather disquieting decrease of birth rate.

THE RELATIVE PREVALENCE OF SPECIAL DISEASES AMONG PORTO RICAN AND FILIPINO NATIVE TROOPS.

It is not perhaps generally realized that the United States maintains in the tropical countries under her control forces, large or small, of native troops. The efficiency of these troops compared with white troops serving under the same conditions and their relative liability to special diseases becomes a matter of considerable interest.

The Porto Rican regiment, of which the enlisted men are all natives, but the officers mostly American, was organized in February, 1901, and has served entirely in its own country. Since May, 1904, no American troops proper have served in Porto Rico, so that the comparisons with white troops refer to those serving in the Philippine Islands. For disease the admission and constantly non-effective rates of the Porto Ricans are slightly better than for white troops in the tropics, but their death and discharge rates are higher. Typhoid fever was very rare until 1906, when an outbreak occurred with nine cases and two deaths. Malaria, while steadily increasing in prevalence, has always shown a lower rate than for white troops; the rate for dysentery is less

than a tenth of that among white soldiers in the Philippine Islands. Tuberculosis and alcoholism are much less frequent among the Porto Ricans, while acute articular rheumatism and all forms of venereal diseases give far higher rates than for the white troops.

Comparing Porto Rican troops with Filipino native soldiers, the former have much higher rates for filariasis, influenza, venereal diseases and articular rheumatism, while the latter show a far greater prevalence of beriberi, dhobie itch, dengue, tropical ulcer, malaria and dysentery. Beriberi, which has not been reported among the Porto Rican troops, causes a large non-effective and death rate among the Filipinos.

Comparing Filipino troops with white American troops serving in the same locality, we find, as is to be expected, that the admission, discharge and non-effective rates for the former are considerably lower than for the latter. This is explained by the fact that the Filipinos are serving at home under conditions natural to them, but inimical to the white race; nevertheless, the death rate is considerably higher among the Filipinos. This is largely accounted for by the undue prevalence of tuberculosis, cholera and beriberi among the latter.

The Americans suffer more from venereal diseases and alcoholism, the latter condition being very rare among the Filipinos, from dysentery and diarrhea, from dengue, rheumatism and typhoid fever, while the Filipinos are especially liable to malaria, beriberi, bronchitis and pneumonia.

STAPHYLOMYCOSIS.

As has been observed, septicemia and pyemia have now become medical rather than surgical diseases. It might further be added that the advent of bacteriology, and especially the use of blood cultures, has led to the division of septicopyemia into subvarieties according to the etiology. The most important of these subdivisions are streptococcus sepsis, or, as some prefer to call it, streptococcemia, and staphylococcus infection or staphylomycosis. A good deal of attention has been given in this country to blood culture work, and some writers, Libman, for example, have published the results of extensive observation. The various causal factors and the common sites of infection in streptococcus sepsis have been pretty well exploited, but the same is not true of the staphylococcus infections.

Under the caption, "Staphylomycosis," Otten[1] has recently given an extensive résumé of the medical aspect of staphylococcus sepsis, based on fifty-five cases observed in the clinic of Lenhartz. The origin of the sepsis demonstrates in a very forcible way the fact that the most serious general infection may originate from the most trivial local focus. We were prepared to expect that in diabetics and other debilitated individuals infection from trivial injuries would be reported, but that serious sepsis frequently originates in individuals in ordinary health from boils, paronychiæ and superficial skin wounds, is rather a surprise. Otten's figures show that in over 5 per cent. of all patients with staphylomycosis the infection originated from a boil or carbuncle, a panaritium, or a slight wound of the skin. Infections from the mucous membranes, and especially from the urinary tract and the puerperal uterus, were next in importance, and, finally, osteomyelitis appears as a fairly frequent source. The variety of staphylococcus present seems to make no difference in either the extent or the severity of the lesions. It has commonly been held that *Staphylococcus aureus* is more virulent than *Staphylococcus albus*, but this is not borne out by the experience in the Hamburg clinic. About 80 per cent. of the patients succumbed to the infection, a distressing number when we consider the indifference with which the commonest sources of infection in this class of cases are regarded.

The localization of the metastases in staphylomycosis varies considerably in different patients. There may be a single metastasis in the form of an abscess of the liver, brain or perirenal tissues, or there may be multiple small foci of pus. A striking fact brought out by Otten's inquiry is the frequency with which endocarditis is associated with staphylococcus infections, especially those which originate in the urinary tract. In 25 per cent. of the patients observed by Otten endocarditis developed. Most commonly the mitral valve or the mitral and aortic valves were the ones involved. Occasionally the tricuspid or pulmonary valves were implicated. This is a striking contrast to the frequency of endocarditis as an association of streptococcus infection, in which it occurs in only a trifle over 4 per cent. of the patients.

A depressing fact which studies like this often bring to mind is the futility, up to the present, of our efforts to combat most acute bacterial infections. In a few instances, active surgical intervention and the evacuation of local collections of pus leads to prompt recovery. In many others, it seems as if we could but sit by with folded hands and watch the patient die. Bacterial vaccination has not yet been properly tested in this class of cases; perhaps something is to be hoped from it. Otten's study demonstrates the great value of the systematic examination of cultures from the blood, spinal fluid, urine and pus in reaching a diagnosis. In some instances, an accurate diagnosis is undoubtedly life saving, for it leads to a more careful search for metastatic abscesses, and the search is often successful.

1. Deutsch. Arch. f. klin. Med., July 10, 1907.

STREET ACCIDENTS.

It is well known that in our large cities many physicians are in the habit of ignoring the gathering of excited individuals on the street corner, which tells of the presence of a victim of some accident or sudden illness, with about the same degree of assiduity that a debtor

might display in overlooking the presence of some passing creditor. The explanation which one often hears for the assumption of this attitude sounds reasonable enough on the face of it: "I have no instruments, no medicine with me, and if I had them I should probably not have time to make use of them. The ambulance will be here in a few minutes and the patient will be taken to the hospital, which is surely the best place for him. By pushing in I shall be able to accomplish nothing and shall just add one to the crowd which is already too large." And so the patient is left to the tender mercies of innumerable would-be good Samaritans, who, in lieu of oil and wine, administer generous doses of whisky, souse the patient with water, and enthusiastically order each other about.

While the physician's conjecture as to the probability of his being of any material assistance is undoubtedly correct in the majority of instances, it occasionally happens that prompt action might be the means of saving life. An improvised tourniquet or digital pressure intelligently applied in case of a dangerous hemorrhage, or the immediate application of artificial respiration to a victim of electric shock or drowning might be the occasion of saving a life which would be sacrificed if no treatment were instituted until the arrival of the ambulance. An interval of ten to twenty minutes not infrequently occurs before it is possible for an ambulance to reach the scene of accident. It is, therefore, the duty of a physician to at least ascertain what the trouble is and whether his services are required.

If life is not threatened the physician can often do much to render the patient more comfortable until further assistance arrives. The very fact that some one is present who recognizes the condition and knows what should be done is often of inestimable comfort to the injured one. The authoritative voice of the physician can at least stop the senseless and often harmful efforts of the volunteer helpers. In case of syncope any constricting clothes can be loosened, and even the epileptic, who creates such a sensation among the onlookers by his dramatic performance, will surely appreciate a little care exercised in saving his tongue another vicious laceration. The passing physician will nearly always prove to be of some assistance, and by volunteering he may save himself the reproach of allowing the death of some individual when it was within his power to prevent it.

ONE WAY TO CHECK FOURTH OF JULY CASUALTIES.

One way to make a sane Fourth of July seems to have been demonstrated in Council Bluffs, where the chief of police utilized the principle of setting a rogue to catch a rogue very cleverly and with the best results. He began some years ago making arrests during several days preceding the Fourth, and let the offenders off on condition that they should serve as special police to prevent others violating the ordinances. The plan worked so well that he has continued it, and this year, the day before the Fourth, he swore in as special police, and furnished with stars, twenty-five boys and girls representing some of the best families in the place, with the result, it is said, of giving the town the safest and sanest Fourth it has ever enjoyed. Whether such a plan would work as well in very large towns may perhaps be questioned, but it appears that it might be an excellent thing in many smaller cities and in the small towns and villages that furnish so many of the casualties of the Fourth. Any arrangement that reduces traumatisms and mortality is well worth trying again, and this Council Bluffs idea seems at once directly preventive and educationally useful.

SUICIDE AS RELATED TO INSANITY.

The act of self-destruction, in civilized countries, is a transgression of the law, and, as such, is not to be countenanced. Whether or not it is ever justifiable is a question that can only be decided in the individual case after a thorough consideration of all of the attendant circumstances. The natural tendency in all healthy human beings, and in fact in all animals, is toward self-preservation, sometimes even at the expense of others. Occasionally some powerful impelling motive, such as a highly developed sense of duty, may lead to the sacrifice of the individual to preserve the welfare of others. Under ordinary circumstances, inducement for self-destruction is wanting. Conditions, however, do arise at times in which a person reaches the conclusion that death is preferable to life, and the question may fairly be asked whether a decision as to sanity or insanity can be based on the answer. Death, usually inflicted by the state, in some instances delegated to the individual, is the legal penalty for some offences. Not a few instances are on record in which a person has given up his life to save the lives of others. Such an act is usually not out of the domain of sanity. In this connection, the question of motive must always be considered. On the other hand, it will not be denied that, in most instances, attempts at suicide represent the working of a diseased mind. Under these circumstances there is a want of apprehension as to the proper relation of things, a reasoning with false premises. As the result of a logical consideration of this subject Dr. T. Claye Shaw[1] holds that the instinct of self-preservation is so modified by man's place in Nature and by his mental development that the actual necessity or advisability of self-destruction at times takes the place of the primary instinct and may become a secondary or developed instinct in itself, and that, therefore, suicide, which is itself not a legitimate act, may yet be the result of a sound mental process. He would reserve the term suicide for the person who deliberately comes to the conclusion to kill himself as the best solution of an *impasse*, while considering those persons in whom disease leads to a fatal termination as the victims of an attack of insanity of destructive nature. He expresses the axiomatic conclusion that the instinct of health is conservative, but subject to the deliberate will, which may extinguish it or invert it, while the instinct of disease is destructive, and the means for its final accomplishment lie in the reaction between the false individual and his surroundings.

1. Lancet, April 20, 1907, p. 1067.

AN EDDYITE FOR PROFIT.

It is one of the common occurrences in the average physician's life work, especially if that work is being done in a city, to have as a patient some individual who makes it a point to sneer at physicians and to belittle medical practice. Poor old Dowie, who has now gone to his reward and whose "church" and its commercial appendages are, like their creator, now in process of dissolution, was most bitter in his denunciation of physicians—in public—so bitter, in fact, that his deluded followers would have died, and in many cases did die, rather than call in a physician. But he, the high priest of his cult, did not hesitate to call in a physician—in private—when he became ill. From Boston comes the news that Joseph Armstrong, a prominent Christian Scientist, manager of the *Christian Science Journal* and publisher of all the Christian Science literature, was needed to give a deposition in the case now pending against Mrs. Eddy. When sought Armstrong could not be found, not having appeared at his office for many days. Investigation revealed the fact that he was suffering from an attack of pleurisy and was under the care of regular physicians. "When the devil was sick, the devil a monk would be; when the devil was well, the devil a monk was he." So the Dowieites, the Eddyites and numerous other "ites" who when well and painfree profess a distrust in, and an abhorrence of, physicians and the profession of medicine, when ill and racked with pain find the medical man a very handy person to have around.

Medical News

CALIFORNIA.

Examination.—A competitive examination for surgeons of the emergency hospitals of San Francisco, will be held August 31.

Physician Exonerated.—Dr. Carlotta R. Deckelman, Monterey, alleged to have been connected with the death of Mrs. Catherine Webster, who died under suspicious circumstances July 31, was exonerated by the grand jury August 8.

Ill and Injured.—Dr. Andrew W. Morton, San Francisco, chief surgeon of the Santa Fé System, was thrown from a stage near Dyerville, August 3, and fractured his nose and two ribs.——Dr. Irvin N. Frasse, Los Angeles, who has been seriously ill, is reported to be convalescent.——Dr. Albert S. Adler is reported to be critically ill at his home in San Francisco.

Personal.—Dr. J. Underwood Hall has been appointed a member of the board of health of San José, vice Dr. M. V. Mulcahy, resigned.——Dr. Frederick W. Browning, Haywards, has been appointed health officer, vice Dr. J. P. Tormey, deceased.——Dr. J. W. Pollard, Los Angeles, has gone to Chicago and New York for postgraduate work.——Dr. Edward F. Holbrook, San José, has been appointed assistant surgeon of the new hospital division of the Southern Pacific System.——Dr. Charles W. Mills, Arcata, has returned from Europe.

Bubonic Plague.—Five cases of bubonic plague, four of which have resulted fatally, are reported to have occurred in San Francisco during the week ended August 17. The patients were, with one exception, of the poorer class of foreigners. Active measures were at once taken by the local, state and federal authorities, and the spread of the disease is not feared. In the case of one patient, a sailor from a coastwise steamer, the steamer was ordered into quarantine with its passengers. The shacks inhabited by the other patients were fumigated and sealed.

DISTRICT OF COLUMBIA.

Personal.—Dr. George M. Kober sailed from Baltimore for Bremen, August 14.——Dr. Charles G. McCallion, believing that he was taking jamaica ginger, swallowed a quantity of formaldehyd August 11 and is seriously ill at the Emergency Hospital.

Examination for Medical Positions.—The examination to fill vacancies as fire and police surgeons; colored medical inspectors of schools; physicians to the poor, and resident physicians at the Washington Asylum Hospital, called for August 16 by the United States Civil Service Commission, has been postponed until September 16.

ILLINOIS.

Smallpox at Winslow.—Owing to the large number of cases of smallpox at Winslow, and the failure of the authorities adequately to enforce the quarantine regulations, the secretary of the State Board of Health has directed Dr. C. E. Crawford, Rockford, inspector of the board, to see that quarantine is maintained.

Traction System Hospital Association.—The McKinley Interurban Traction System has announced the appointment of the following surgeons: Chief Surgeon, Dr. Stephen C. Glidden, Danville; Dr. Charles F. Hough, Champaign; Dr. Jephtha D. Knott, Monticello; Dr. George S. Edmonson, Clinton; Frank M. Ewing, Lincoln; Tyler, Meriweather, Decatur; Fred M. Wilbur, Riverton; George N. Kreider, Springfield; Eliot R. Motley, Jr., Virden; James S. Collins, Carlinville; Joseph Pogue, Edwardsville; J. W. Scott, Granite City, and Carl E. Black, Jacksonville.

Personal.—Dr. Samuel A. Graham, chief of staff of the Eastern Illinois Hospital for the Insane, Hospital, has resigned and will enter practice at his home in Clinton.——Dr. Robert B. Hough, who has been assistant physician at the Asylum for Feeble-Minded Children, Lincoln, has gone to Elgin as first assistant physician in the Illinois Northern Hospital for the Insane.——Dr. James W. Pettit, Ottawa, has been appointed delegate from Illinois to the International Congress on Tuberculosis, to be held in Washington in 1908.——Dr. Arthur E. Prince, Springfield, has purchased property in Bloomington at a cost of $35,000, on which he will erect a building for a sanatorium.

Chicago.

Personal.—Dr. Joseph B. De Lee has returned from Europe.——Dr. Joseph R. Waldmeyer was attacked by a delirious patient August 18, and received a number of scalp wounds and a fracture of the left arm.——Dr. A. L. Derdiger has resumed practice, having returned from postgraduate work in the East.

Contagious Diseases.—Of the 176 cases of contagious diseases reported during the last week, 43 each were of scarlet fever and diphtheria; 37 of tuberculosis; 22 of typhoid; 18 of whooping-cough, and 11 of measles. As compared with the preceding week this is a reduction of 17 in scarlet fever and 5 in measles, while the cases of typhoid were exactly doubled.

Typhoid Fever.—The department of health has issued a warning against typhoid fever, as during the first 16 days of August 33 cases were reported and 31 deaths. This is the highest death rate from the disease since 1903. Typhoid may be expected during the remainder of August and all of September. On the conservative estimate that there are 10 cases in the city for every death reported, there are more than 300 cases.

Chicago's Health.—The total deaths from all causes for the week ended August 17 was 670, 24 more than for the preceding week and 139 more than for the corresponding week of 1906. The respective annual death rates being 16.58, 15.98 and 13.52 per 1,000. Acute intestinal diseases caused 197 deaths; consumption, 57; heart diseases, 44; pneumonia, 41; violence (including suicide), 40, and nephritis, 38. Of the contagious diseases, typhoid fever caused 18 deaths; whooping-cough, 11; scarlet fever, 8; diphtheria, 3, and measles, 2.

KENTUCKY.

Personal.—Dr. Diekran H. Erkiletian, Casky, was elected president of the Society of Free Armenians at the election held in Athens, Greece, July 10.

State Medical Examiners' Meeting.—The Kentucky State Medical Examiners' Association will hold its third annual meeting in Louisville in October in connection with the meeting of the state medical society. Three of the papers are to be presented by medical directors of local insurance companies. All life, casualty and pension examiners in the state are eligible to membership.

Wretched Conditions in Charitable Institutions.—The committee appointed at the request of Mayor Bingham from the

Jefferson County Medical Society, composed of Drs. Sidney J. Meyers, William Bailey and Cuthbert Thompson, to investigate and report on the condition of the eleemosynary institutions of the city, made its first report on the condition of the Louisville City Hospital. As a result of this report the mayor has requested the resignation of Mr. J. C. Vogt, the superintendent, and has signified his intention of appointing Dr. Jewett Menefee to succeed him. About a year ago Dr. Menefee brought charges against the management of the City Hospital; these were investigated by the board of public safety and none of the charges sustained. The report as rendered by the investigation committee bears out practically all of the charges as made by Dr. Menefee. The report shows a deplorable state of affairs at the hospital. The detention ward receives cases of contagious diseases, delirium tremens and persons of unsound mind. This ward is particularly unsanitary, with filthy bath tubs and mattresses, one room having neither light nor air. The wards are overcrowded, the mattresses are filthy and wet; the surgical dressing rooms dirty; there is a scarcity of linens; soiled dressings kept in open cans in the surgical wards several days before removal; no overhead light is provided for in the operating room; the sterilizers are antiquated; dirty ice boxes in the kitchen contain ants, spiders and cobwebs, and the milk cans are uncovered and the milk is unfit for human consumption. There is defective plumbing throughout the hospital; the ventilator shaft is out of use and fans broken; there is an insufficiency of ward helpers; soiled dishes are washed and kept in the ward; no knives or forks supplied to patients; all food except soup is supplied on one plate, etc. The nursing staff is inadequate, and the laundry is unable to meet the wants of the hospital. Tubercular patients are kept in the same ward as those with pneumonia and typhoid fever. This committee will be continued in service, and it has been requested to make monthly reports and suggestions as to the conduct of the hospital to the mayor and board of safety.

MARYLAND.

Baltimore.

Personal.—Dr. J. B. Schwatka is in Denver.——Dr. Edward N. Brush sailed for Europe August 17. He will be a delegate of the United States government to the International Congress of Psychiatry, Neurology, Psychology and Care of the Insane, in Amsterdam, September 2, other delegates to which were mentioned last week.

Changes in Infirmary Staff.—On September 1 the following changes will be made in the staff of the Union Protestant Infirmary. Dr. Lewis Smead will resign and enter private practice in Toledo; Dr. J. R. Carr will succeed him. Dr. Peregrine Wroth will be first assistant physician; Dr. John Caulk, second assistant physician, and Drs. Richard P. Bell and Merle T. Adkins, resident physicians.

MASSACHUSETTS.

Tetanus Placed on List.—The Massachusetts State Board of Health has placed tetanus on the list of reportable diseases.

Gift to Hospital.—Charles H. Morgan and George L. Newton have each given $40,000 to the trustees of the Worcester Memorial Hospital for the erection of new wards at that institution.

Personal.—Dr. and Mrs. Robert W. Lovett, Boston, are in Paris.——Dr. William M. Conant, Boston, fell from an electric car recently and sustained a severe scalp wound.——Drs. Henry R. Stedman, Brookline, and George T. Tuttle, Boston, have been called as experts in the Mary G. Baker Eddy investigation.

MICHIGAN.

Communicable Diseases.—Several cases of typhoid fever are reported from Glenwood, Cass County.——Several cases of smallpox are reported in the vicinity of Woodhull, and quarantine has been established.

Itinerant Medicine Vender Fined.—"Dr." J. F. Bosworth, who was arrested at Battle Creek charged with practicing medicine without a license, on information filed by the Calhoun County Medical Society, pleaded guilty July 30, and is said to have been fined $100.

Personal.—Dr. A. B. Gregory, Ann Arbor, has been appointed assistant to the chair of otolaryngology at the University of Michigan.——Dr. J. M. Peebles, Battle Creek, has returned from a trip around the world.——Dr. Harvey S. Chapman received several scalp wounds from a barbed wire fence while driving east of Pontiac, August 4.——Dr. Robert Wells, Ann Arbor, has been appointed assistant physician at the State Hospital, Traverse City.——Dr. Sair C. Moore, Cadillac, fractured three ribs in a runaway accident, August 3.——Dr. Emile C. Houle, Kearsarge, has resigned as assistant physician at the Wolverine Mine and will accept a similar position at Douglas, Ariz.

MISSOURI.

Unlawful Practitioner Fined.—Judge Taylor, St. Louis, on August 2 is said to have fined Mrs. Bessie Whittle $100 on the charge of unlawfully acting as a physician.

Hospital Plans Accepted.—The plans for the $35,000 addition to the Ensworth Central Medical College and Hospital, have been accepted by the board of trustees. It is expected that the addition will be completed by December 1. The new building will add 30 rooms to the hospital and will provide a new operating room and several laboratories.

Personal.—Dr. Ambrose W. Teel, Kahoka, has been elected professor of physiology in the Keokuk Medical College.——Dr. G. Wilse Robinson, Kansas City, superintendent of State Hospital No. 3, Nevada, assumed charge August 1.——Dr. Virgil Loeb, Columbia, has returned from Europe.——Dr. Charles R. Woodson, St. Joseph, has organized a company to establish and conduct a large sanitarium south of St. Joseph.

State Sanatorium.—The Missouri State Sanatorium for Incipient Pulmonary Tuberculosis, Mount Vernon, was formally opened August 1. Patients unable to pay are required to make affidavit to the county clerk, and after investigation as to correctness, are sent to the sanatorium in the order in which their names appear on the waiting list. Patients able to pay make application to the sanatorium direct, and when vacancies occur, the person whose name is first on the list is referred to the nearest examining physician, who reports the result of his examination to the chief physician, Dr. O. H. Brown, at the sanatorium. A second villa is now under construction, which will be ready for occupancy about January 1. The third building, the medical wing of the administration group, will be ready for use early next year.

NEVADA.

Personal.—Dr. Charles E. Mooser, Reno, suffered severe contusions from the overturning of his automobile recently.——Dr. M. Rollin Walker has been appointed health officer of Reno, vice Dr. John L. Robinson, resigned.

Hospital Notes.—The Miners' Union Hospital, Goldfield, was opened July 16 with Dr. A. E. Wheeler as surgeon in charge. The building is a semi-fireproof structure, 70 by 70 feet, with accommodation for 60 patients, and has cost $45,000.——A new hospital is soon to be opened in Goldfield by Dr. Paul F. Cope.

NEW YORK.

Anthrax in Orange County.—Anthrax has broken out in several dairies in Orange County, and the state veterinarian, Dr. Devine, has ordered all exposed cattle isolated. Great efforts are being made to stamp out the disease.

Harbor Pollution.—Edward Hatch, Jr., chairman of the pollution committee of the Merchants' Association of New York City, has complained to Governor Hughes that all the boroughs of Greater New York are polluting this harbor illegally, and that other cities of the state are also guilty.

Insufficient Help in State Institutions.—The management of the state institutions is having great difficulty in the effort to keep a sufficient number of attendants and helpers. The thirteen state hospitals are now short over 500 employés, the reason given being that outdoor employment offers greater attractions and because of the higher wages paid in the country.

Personal.—Dr. Henry B. Hopkins, Buffalo, has been appointed one of the commissioners to examine into the mental condition of Mary Baker G. Eddy.——Dr. Lacey B. Darling, health officer of Palmyra, has resigned, and Dr. William J. Hennessy has been named as his successor.——Dr. Russell E. Blaisdell, Poughkeepsie, has been appointed physician at the Hudson River State Hospital, Poughkeepsie.

New York City.

Hospitals Censured.—The coroner's jury found the following verdict at a recent inquest: "We censure the Manhattan State Hospital and Bellevue Hospital for failure to give the deceased proper treatment while in their care, and recommend that the Manhattan State Hospital increase the number of their attendants and adopt a system of reports to show the exact status of every patient at all times, making it possible for the authorities to ascertain at any time who is in charge of a patient."

Contagious Diseases.—There were reported to the sanitary bureau for the week ended August 10, 398 cases of tuberculo-

sis, with 148 deaths; 221 cases of measles, with 20 deaths; 211 cases of diphtheria, with 22 deaths; 117 cases of scarlet fever, with 6 deaths; 82 cases of typhoid fever, with 18 deaths; 39 cases of whooping-cough, with 17 deaths; 7 cases of cerebrospinal meningitis, with 14 deaths; 14 cases of varicella, and one case of smallpox, a total of 1,090 cases and 245 deaths.

Personal.—Dr. Francis H. Markoe is seriously ill and little hope is entertained of his recovery.——The coroner's jury decided that Dr. James E. Russell, who was found dead on July 21, was "garroted" by persons unknown.——Dr. and Mrs. Aspinwall Judd, Dr. and Mrs. Charles C. Reid arrived from Europe August 15, and Dr. Clarence A. McWilliams, July 15. ——Drs. D. Bryson Delavan, M. S. Gregory and Edward N. Brush sailed for Europe August 17.——Dr. John S. Billings, director of the New York Public Library, has gone to Europe, where he expects to visit all the principal hospitals, and will apply the result of his observations of the equipment of the new Harvard Medical School Hospital, Boston, which will be built under his supervision.

OHIO.

Barbers Fined.—The health officer of Cleveland, on account of the prevalence of barber's itch in that city, has had several barbers arrested because they do not follow the letter of the law as regards cleanliness. Three were fined $5 and costs; two received suspended sentences, and the others asked to have their cases continued.

Infectious Diseases.—During the 21 weeks ended July 27 infectious diseases were reported from 113 localities as follows: Measles 5,074 cases, with 51 deaths; diphtheria, 924 cases, with 103 deaths; typhoid fever, 844 cases, with 122 deaths; scarlet fever, 835 cases, with 80 deaths; whooping-cough, 497 cases, with 25 deaths; smallpox, 92 cases, with no deaths.

Personal.—Dr. H. Edwin Heistand, Kenton, was seriously injured in an automobile accident recently.——Dr. James D. McAfee has resigned as a member of the board of health of Cleveland.——Dr. Robert Carothers has been appointed junior orthopedic surgeon to the Cincinnati City Hospital.——Dr. Frank A. Stickney, Kilbourne, is making a good recovery after the amputation of his leg in Columbus.——Dr. George F. Zinninger, Canton, who was operated on for appendicitis recently, is making a good recovery.——Dr. Walter J. Smith, Reily, is reported to be seriously ill with septicemia due to an operation wound.——Dr. Albert E. Griffin, Columbus, suffered amputation of the finger at the Grant Hospital recently.——Dr. Joseph J. Dunn, house physician at St. Alexis Hospital, Cleveland, was operated on for appendicitis August 13.——Dr. Parker F. Southwick, Sandusky, has been elected coroner of Erie County.——Dr. Jesse O. Glass, Springfield, has returned from Europe.——Dr. Ruth Bernheim, Cincinnati, has gone to Europe.——Dr. Charles C. Mandeville, Galion, fell recently while boarding a street car and fractured his leg at the ankle. ——Dr. Elwood E. Arnold, Columbus, physician at the state penitentiary, has resigned to accept a position with the Pennsylvania System.

PENNSYLVANIA.

Personal.—Dr. George N. Mealy, New Wilmington, received serious injuries recently by the falling of a tree.——Dr. Mary M. Wolfe, of the State Asylum for the Insane, Norristown, sailed for Europe August 17.

Hospital Contract Awarded.—The contract for the erection of five buildings and dormitories for the State Hospital for Epileptics at Spring City, was awarded August 13. The cost of the construction of the buildings is $251,504.

Cocain Sellers Fined.—J. J. Naser and G. F. Smith, druggists of Washington, are said to have pleaded guilty before the grand jury of having sold cocain to habitual users of the drug and filling prescriptions which were not genuine, and to have been fined $100 each.

Infantile Paralysis Epidemic.—It is reported that an epidemic of infantile paralysis has broken out in Ridgway. The disease has been raging for three weeks and the malady is not limited to children, but several adults have been attacked. There are at present nearly 200 cases of the malady in this city and the death rate has been very high. The disease is in a violent form, and the persons afflicted, as a rule, range in age from 5 to 13 years. It is reported that thus far three out of every four have succumbed. Typhoid fever is also raging in Ridgway.

Philadelphia.

Bequests.—By the will of the late Annie Potts the West Philadelphia Hospital for Women and the Home for Incurables receive $300 each; the Home of the Merciful Savior for Crippled Children, $200.——A provisional bequest of one-third of an estate valued at $30,000 to the Presbyterian Hospital is contained in the will of the late Elizabeth McElroy.——The will of the late Martha A. Stewart bequeaths $4,800 to the Rush Hospital for Consumptives.

Personal.—Dr. Mazyck P. Ravenel, delegate of the United States at the International Congress of Hygiene and Demography, and recently elected professor of bacteriology at the University of Wisconsin, sailed for Europe August 11.——Dr. Mary P. S. Rupert, anesthetist of the Woman's Hospital, sailed for Europe August 3.——Dr. S. Weir Mitchell is spending the summer at Bar Harbor, Maine.——Drs. Lawrence F. Flick, Joseph Walsh and Daniel J. McCarthy will sail for Europe August 29 to attend the International Conference on Tuberculosis in Vienna.

Health Report.—The total number of deaths reported for the week ended August 17 was 502. This is a decrease of 35 from the preceding week and a decrease of 37 from the corresponding week of last year. The principal causes of death were: Typhoid fever, 10; pertussis, 8; diphtheria, 6; meningitis, 2; consumption, 54; cancer, 19; apoplexy, 20; heart disease, 40; acute respiratory disease, 20; enteritis, 99; appendicitis, 6; Bright's disease, 34; congenital debility, 21; premature birth, 12; suicide, 3; accidents, 16, and marasmus, 16. There were 152 cases of contagious disease reported, with 19 deaths, as compared with 131 cases and 19 deaths reported in the preceding week.

TENNESSEE.

Free Dispensary.—The Memphis Free City Dispensary was reopened August 5 under the charge of Dr. G. W. Cunningham.

Tuberculosis Hospital.—A hospital for consumptives is to be built at the state penitentiary, where there are said to be at present 45 patients afflicted with the disease.

Typhoid in Nashville.—During the week ended July 27, 104 cases of typhoid, with 4 deaths, were reported in Nashville. The water suppply of the city, which is supposed to be at fault, is being investigated.

Personal.—A desperate attempt was made to kill Dr. L. Frank Sory, Adams, August 5. Dr. Sory is a member of the Tobacco Growers' Association, and it is supposed that the assault was made by individuals opposed to that organization. ——Dr. W. H. Pistole, Memphis, has been appointed professor of materia medica and therapeutics in the College of Physicians and Surgeons of that city.——Dr. E. A. Barber, Graysville, has been appointed assistant surgeon of the Mexican Central Railroad, with headquarters at Guaymas, Mexico.——Dr. Edward T. West, National Soldiers' Home, has been appointed governor and surgeon of the Battle Mountain Sanatorium, Hot Springs, S. D.

TEXAS.

Investigators Contract Dengue.—Passed Assistant Surgeons Joseph Goldberger and George McCoy, attached to the Hygienic Laboratory of the Public Health and Marine-Hospital Service, who, on the outbreak of dengue at Brownsville, were detailed by the surgeon general to make a thorough investigation of the nature of the disease, soon after establishing an efficient working laboratory and beginning work contracted dengue, and on this account the investigation is temporarily interrupted.

New Medical Board.—The governor has announced the appointment of the State Board of Medical Examiners, as follows: Drs. James D. Osborne, Cleburne; Edwin P. Becton, Greenville; William B. Collins, Lovelady; Garland B. Foscue, Waco, and John J. Dial, Sulphur Springs, of the regular school; Drs. John D. Mitchell, Fort Worth, and Thomas J. Crowe, Dallas, of the homeopathic school; Drs. Marquis E. Daniel, Honey Grove, and J. P. Rice, Fredericksburg, of the eclectic school; Dr. Radford O. Braswell, Mineral Wells, of the physio-medical school, and R. W. Collins, El Paso, an osteopath.

To Prevent the Spread of Tuberculosis.—The rules of the State Board of Health to govern the sanitation of tuberculosis contain the following clauses:

Tubercular victims are not allowed employment in any public building, in any school, church or bakeshop or slaughter house. Burlap is prohibited for a floor covering; passengers on trains are not allowed to wash their teeth over wash basins and careless handling of ice to be used in water coolers is made an offense.

Floors of public buildings must be swept every day after being sprinkled with sawdust wet with formaldehyd. Boarding house, hotel and restaurant ice boxes must be scoured and treated with acid once a week.

In jails a prisoner must have 3,000 cubic feet of air an hour, walls must be whitewashed every month and painted every six months.

Personal.—Drs. Oscar M. Marchman and Miles J. Duncan have been appointed members of the Dallas board of health. ——Dr. J. R. Nichols, first assistant physician at the Northern Texas Insane Asylum, Dallas, has resigned.——Dr. Pierce M. Kuykendall, Moody, sustained a fifth cerebral hemorrhage, August 1.——Dr. D. E. Cloud, Austin, has been appointed third assistant physician at the Southwestern Insane Asylum, San Antonio, vice Dr. Bruce Allison, resigned.——Dr. Benjamin F. Gibson, Midway, physician at the state penitentiary, Huntsville, has resigned.——Dr. Alfred E. Thayer, professor of pathology in the University of Texas, has resigned and will move to Asheville, N. C.——Drs. William Olive and Lewis E. Pearce, Houston, sustained painful contusions as the result of a runaway accident, August 11.

VIRGINIA.

Society Meeting.—The Augusta County Medical Society held its regular quarterly meeting August 14 at Staunton. The attention of the society was drawn to the presence of illegal practitioners in the city and county, and a committee composed of Drs. Charles W. Rodgers, Staunton; Thomas M. Parkins, Staunton, and Walter F. Hartman, Swoope, was appointed to bring this matter to the attention of the attorneys of the commonwealth. The following officers were elected: President, Dr. Samuel H. Burton, Parnassus; vice-presidents, Drs. Clarence T. Lewis, Staunton; R. Sumpter Griffith, Basic City, and John F. Armentrout, Staunton; secretary, Dr. Achilles L. Tynes, Fishersville; treasurer, Dr. Thomas M. Parkins, Staunton (re-elected), and censor, Dr. Walter F. Hartman, Swoope.

Personal.—Dr. Albert W. Freeman has been appointed to succeed Dr. E. Guy Hopkins, city bacteriologist of Richmond, resigned.——Dr. Littleberry S. Foster, superintendent of the Norfolk Protestant Hospital, has resigned, to take effect August 15.——Dr. Edward H. Claud, Norfolk, who was operated on for appendicitis a few days ago, is reported to be convalescent.——Dr. William S. Drewry, Petersburg, has been elected president of the Virginia Home and Industrial School for Girls. ——Dr. Ralph W. Browne, Roanoke, recently operated on for appendicitis in Richmond, is reported to be convalescent.—— Dr. Edward A. Waugh, Lynchburg, is at present in Los Angeles.

GENERAL.

Sixth International Dermatologic Congress.—The Sixth International Dermatologic Congress will be held at the Academy of Medicine, New York City, Sept. 9-14, 1907. An address of welcome on behalf of the United States will be delivered by Surgeon-General Rixey of the United States Navy; an address for the American universities will be delivered by Prof. Ira Remsen of Johns Hopkins University; and an address for the medical profession of the United States by Dr. Joseph D. Bryant, President of the American Medical Association. Papers will be read by some of the most famous European dermatologists, including Prof. R. Campana, Rome, Italy; Dr. Z. Falcao, Lisbon, Portugal; Dr. Vinetta-Bellaserra, Barcelona, Spain; Dr. L. Brocq, Paris; Dr. Unna, Hamburg, Germany; Dr. M. Oppenheimer, Vienna; Prof. E. Kromayer, Berlin; Prof. E. Hoffmann, Berlin; Dr. A. Buschke, Berlin; Drs. Hallopeau and Gastou, Paris; Prof. S. Ehrmann, Vienna, and numerous others. Papers are also on the program by the leading dermatologists of this country. Further details may be obtained from the secretary-general, Dr. John A. Fordyce, 60 West Fortieth Street, New York City.

CANADA.

Resignations.—Dr. W. A. Wilkins, professor of histology in McGill University, Montreal, has resigned.——Dr. Norman E. McKay has resigned as professor of surgery in Halifax Medical College and has been succeeded by Dr. Edward V. Hogan.

Canadian Medical Association.—The fortieth annual meeting of this association will be held in Montreal, September 11 to 14, under the presidency of Dr. Alexander McPhedran, Toronto. Dr. Davy Rolleston, London, Eng., will deliver the address in medicine; Dr. Ingersoll Olmsted, Hamilton, the address in surgery, and Dr. J. George Adami, Montreal, the address in pathology. In the medical section there is to be a discussion on cerebrospinal meningitis, and in the surgical section a discussion on hypertrophy of the prostate. There is to be a new section this year for pathologic workers, for which a number of scientific papers have been promised.

British Columbia Medical Association.—The eighth annual meeting of the British Columbia Medical Association was held in Victoria on August 1 and 2, under the presidency of Dr. Roderick L. Fraser, Victoria. An important discussion took place on the subject of "patent" and proprietary medicines, and the following resolution was adopted and ordered to be transmitted to the Canadian Medical Association:

WHEREAS, It is morally incumbent on every medical man to prevent the public against disease and sickness as far as possible, and

WHEREAS, The so-called patent medicine is sold without restriction throughout this Province, thereby constituting a menace to the public health, and

WHEREAS, Proprietary medicines, the composition of which are not known, are prescribed by regular physicians to a certain extent, therefore, be it

Resolved, That the British Columbia Medical Association place itself on record as being in favor of the enactment of suitable laws for the protection of the public against patent medicines, and

Resolved, That it appoint a committee whose duty it shall be to institute such measures or support them if introduced by the legislators, and

Resolved, That it strongly disapproves of the unscientific and possibly dangerous practice of prescribing the secret proprietary medicines, and

Resolved, That the British Columbia Medical Council be requested to communicate with all physicians of the province, drawing their attention to the undesirability of prescribing these secret proprietary medicines. The treatment of advanced cases of consumption was also discussed and a resolution passed calling on the government to insist that all hospitals receiving government aid be compelled to provide for a limited number of such cases.

The teaching of public health in the schools was also brought up and a committee appointed to make suggestions whereby the present text-book in use in the public schools which in the opinion of the association is unsatisfactory, should be improved. The following officers were elected for the ensuing year: President, Dr. John M. Pearson, Vancouver; vice-president, Dr. Douglas Corson, Fernie; treasurer, Dr. James D. Helmcken, Victoria, and secretary, Dr. R. Eden Walker, New Westminster (re-elected).

FOREIGN.

International Congress Postponed.—The Fifth International Gynecologic Congress, which has already been postponed once, and which was to have been held in St. Petersburg, has again been put off, the *British Medical Journal* says: "On account of numerous expressions as to the inopportuneness of a congress in Russia."

Premiums for Temperance.—The directors of the iron and steel works of Röchling (Völklingen a. Saar), make the following announcement: "We have concluded that even for furnace work those laborers are more valuable who use no alcohol at all. Therefore, we have decided to distribute premiums to those laborers who are members of a Good Templars' lodge for more than one year, in the following manner: Such laborers as have been members for a year will receive a premium of 10 marks per quarter; those who have belonged to the lodge for two years will receive 15 marks per quarter, and for every succeeding year of membership in the lodge the premium will be increased 5 marks per quarter."

Hospital Appointments in South Africa.—According to the *South African Medical Record*, the staff of the Johannesburg Hospital is vigorously opposing a ruling of the governing board that the board at any time may appoint outside practitioners directly to the senior medical and surgical posts of the hospital. It is claimed that this rule would not be exercised ordinarily, but would be held in reserve in case of any European celebrity who might happen to settle in Johannesburg, and whose services would be lost to the institution if he had to pass through the drudgery of out-patient work. In commenting on the situation, the London *Lancet* remarks that it is in sympathy with the junior members of the staff. It is unfair, the *Lancet* declares, that those who have borne the burden and the heat of the day should be ousted from the clinical reward of their labors by the chance advent of some "European celebrity" who is unwilling to follow in their industrious footsteps.

LONDON LETTER.

(*From Our Regular Correspondent.*)

LONDON, Aug. 8, 1907.

Trachoma in London.

Trachoma is prevalent in the East End of London. The great hospital in Whitechapel is largely used by those aliens, who are not allowed entrance into America, but who are unable to get back to their own country. It seems likely that trachoma will continue to spread in the East End of London under present conditions, and its prevalence is a convincing object lesson on the laxity of British laws in regard to the ingress of foreigners.

Award of Baly Gold Medal.

Prof. Ernest H. Starling, M.D., F.R.C.P., F.R.S. Jodrell, professor of physiology at University College London, has been awarded the Baly gold medal of the Royal College of

Physicians of London. The medal is given every alternate year to the physiologist who has most greatly distinguished himself in his special branch of science during the preceding two years. Professor Starling has made many important investigations, including explanations of the manner in which the pancreatic secretion containing the ferment trypsin is formed.

The New York Optometry Bill.

Much surprise has been expressed in medical circles in Great Britain at the passage of the bill in New York state, which confers on opticians the right to practice a "specialty of medicine," the same bill further providing for the institution of an examining board of opticians.

International Housing Congress.

An international congress on this subject has been held in London recently. Mr. John Burns, president of the Local Government Board, in speaking of the overcrowding of cities, said that London is making progress. It is not true of London to-day, as Charles Dickens said of London sixty years ago, that "the very crutches on which the ruins are propped are decaying," or that the poor of London live in "brick boxes with slate lids." At present in London 1 in 7 of the population lives at the rate of two in a room. In Manchester it is 1 in 6, in Edinburgh 1 in 3, and in Glasgow 1 in 2. The population per house in England, where people live in cottages, is 5; in London it is 8; in New York, where people live in tenements, it is 20; in Paris, where they live in flats, 26; in Berlin, where they live in barrack dwellings, there are 46 per house. In New York there are 350,000 dark rooms, and 2,300,000 persons live in 82,000 tenement houses.

International Congress of School Hygiene.

The second congress was held at the University of London, August 5. The address of welcome was made by the Earl of Crewe. In his presidential address, Sir Lauder Brunton said that one of the most important subjects is medical inspection of school children, and that it is really the keystone of medical education. He emphasized the importance for weak anemic children of plenty of fresh air and sunshine, and praised work of the London County Council in opening the open-air school at Abbey Wood, where weakly children can have the fresh air, rest and abundant food necessary to restore them to health and strength. He also spoke of the separate schools, which are now being established for crippled children, and for those who are mentally defective. He urged the necessity for physical training of all children, and stated that much could be done for cripples by this means. He said that the system of cramming children is greatly to be reprobated, and that the body requires quite as much careful attention as the mind. He stated that one of the most difficult and yet one of the most important questions of school hygiene is how to combine educational with physical training, so that both may be productive of benefit and not of injury to the child.

Contribution to King Edward's Hospital Fund.

The Bank of England has received from Mr. Andrew Carnegie the sum of £100,000 ($500,000) for King Edward's Hospital Fund. The gift is made unconditionally, and Mr. Carnegie expressed the desire that it should be used as seems best, adding "The more strenuously for reform the better."

Public Health Laboratories for Medical Women.

The Middlesex Hospital has opened well-equipped laboratories which will be devoted entirely to the training of medical women in public health work and providing them with facilities for research work in bacteriology. Public health is eminently a subject for which medical women are suitable, as in the practice of it they have to encounter none of the prejudices and suffer from none of the inabilities which interfere with them in the practice of medicine. There is a large field of usefulness for them in certain branches of the public health service, in the medical inspection of factories and schools, and in the administration of the recently passed Midwives Act. Many posts of this kind are already well filled by specially trained medical women, and in the near future the number will certainly be much increased. Research work in bacteriology, involving as it does a tedious attention to detail and a technic of extreme delicacy, is also a work for which women are well adapted. The laboratories are now open for work under the charge of Mr. A. G. R. Foulkerton, the director of the bacteriologic and public health department of the Middlesex Hospital, with Miss Hilda Whittingham, M.B., as assistant. To some extent the laboratories will be self-supporting from the first, but financial assistance from the public is asked to meet the possibility of a deficit in the future and to enable scholarships in bacteriology to be offered for women only.

Hygiene in Swimming Baths.

Sir Clement Cooke of the London County Council, has introduced a very sensible motion for ensuring greater cleanliness in swimming baths. He proposes, following the example of German baths, that all persons, irrespective of age or sex, be required before entering a public swimming bath to wash their hands and feet; and that for this purpose sufficient appliances and accommodation be provided. Any one who has seen a public swimming bath after a few hundreds of persons have used it, will appreciate the object in view. It is true that at present the bath attendant has power to compel any person with usually dirty feet to wash them, but it is impossible for the attendants to examine the feet of all the bathers.

VIENNA LETTER.

(*From Our Regular Correspondent.*)

VIENNA, Aug. 8, 1907.

Serum-Producing Horses.

There are at present at the Vienna Serotherapeutic Institute forty-seven horses used in the production of the various therapeutic sera. Most of the animals are those that have formerly served in the artillery service, and are not full-blooded stock. Full-blooded animals do not easily respond to the loss of blood entailed in this work. The animals when purchased are between 6 and 8 years old, and many of them have been in the institute from ten to fifteen (one even twenty-three) years, and are still capable of giving a serum of high potency. They are, of course, kept scrupulously clean and are given an ample amount of food and exercise. Of the horses at present in the stables, twenty-six are immunized against diphtheria, two against streptococci derived from many sources and three horses each against cholera, typhoid fever, tetanus, scarlet fever and cerebrospinal meningitis (pneumococci and meningococci). Two horses have been specially immunized against puerperal fever with cocci obtained from the patients in three different cases, and the serum from these animals has been used with gratifying success at the clinic of Professor Chrobak. The institute supplies not only the clinics, but has the serum for sale to physicians. The horses must be capable of being bled of six liters (1½ gallons) of blood every two months, and in the second year the same amount is withdrawn every four or five weeks. The recuperative power of the organism is thus put to severe test.

Mine Sanitation.

The last coal mine disaster demonstrated that a number of lives could have been saved if means were provided to prevent the inhalation of irrespirable gases. The state mines in Bohemia are equipped each with a safety chamber supposed to be gas and explosion proof, and each contains a number of breathing appliances. This device has been recommended, by the commission appointed to inquire into the subject, as the best means at present available for providing safety for the miners. Electricity is recommended as the best illuminant in the place of the old Davy lamp. Proper ventilation has to be strictly and scrupulously attended to, and large exhausters have to be placed so as to produce a constant current of air toward the opening of the shaft.

Sanatoria for Tuberculosis and Their Location.

Although experimental evidence has proved that sanatoria and hospitals for the tuberculous are in no sense a menace to the public if such institutions have their own grounds and sanitary arrangements, property owners in many cities are insisting that no such institutions shall be erected within a shorter distance from inhabited areas than six miles. This movement is especially strong in the so-called health resorts and watering places, where a diminution in the number of yearly visitors is feared. Local authorities propose, as a compromise, to fix the distance at about four miles, and to select the site of the sanatorium so as to prevent contamination of air or water.

Medical Fees.

One of the higher courts of Austria recently rendered a decision in a case brought by a physician to recover his fees. The physician had attended half a year previously the wife of a wealthy merchant and had called in a consultant; he sued for both his own fee and that of the consultant. Judgment was rendered for the plaintiff, and the judge remarked that strictly speaking payment of the fee was due the moment medical attendance ceased. As regards the fee for the consultant, the patient is liable for its payment, even if he was not asked beforehand, as soon as he submits to examination by the consultant.

Therapeutics

[It is the purpose of this department to outline an up-to-date management of disease, to suggest scientific treatment for diseased conditions, and to present prescriptions that are simple, useful and palatable. Prescriptions are written in both the metric and apothecaries' systems, but the amounts of the ingredients are NOT exact translations of one system into the other, but quantities convenient for pharmacist and physician. It should be understood that solids are weighed in grams or fractions of grams, while liquids are measured in cubic centimeters; that a teaspoon holds five cubic centimeters, i. e., more than a fluid dram, hence a 100 cubic centimeter preparation will contain twenty doses.]

Rational Treatment of Disease.

The scientific treatment of disease must always take into consideration the etiology, the physiologic disturbances that are taking place, the pathology of the disease, and the severity of the symptoms. The aim of the treatment, then, is to prevent, if possible, further action of the etiologic cause, to remove that cause if it can be removed, and to combat the cause with its antidote or specific opponent if there is such. The next object of treatment is to remove immediately or gradually, if it can be removed, the pathologic conditions caused by the disease, and while doing this the normal physiology of the system should not be interfered with lest by too active treatment aimed in a shotgun manner at the pathology, the normal ability of the system to combat disease be interfered with. The aim should be never to obstruct Nature's protective ability by giving strong drugs in such amounts as to obstruct physiologic and antitoxic processes.

The last object of treatment, although an important one, is and always must be to ameliorate, or to remove if possible, the conditions that interfere with the process of repair, that interfere with the nutrition of the body, that interfere with the sleep and comfort of the patient, and that if allowed to persist, would create complications which would intensify the seriousness of the primary disease.

Any one who decries with the approbious term of "symptomatic treatment" the necessary modification of objectionable symptoms of disease is one who has not practiced medicine at the bedside except as a consultant, or in public institutions.

Stricture of the Urethra.

Dr. Alfred C. Wood, Philadelphia, in the *Penn. Med. Jour.*, July, 1907, sums up the treatment of this condition, which is so often mismanaged, as follows:

"The problem in the treatment of urethral stricture, therefore, is the removal by stretching and absorption of the deposit of fibrous tissue. The secondary results, chronic catarrh, ulceration, etc., will disappear spontaneously if the former is accomplished. On the exterior of the body similar deposits would be treated by massage, passive movements, etc. This principle can be applied to strictures only by the introduction of instruments to dilate the contracted part of the canal; and, just as skillful massage is the most effective means of treating external fibrous deposits, so is proper dilatation the most efficient means of treating strictures. This can not be stated too forcibly. It should be an invariable rule never to cut a stricture if it can be dilated. It is a matter of universal clinical experience that traumatic strictures do not, as a rule, respond to dilatation. These must, therefore, be cut. Let it be understood, however, that cutting never cures a stricture; in fact, it adds a fresh trauma and additional cicatricial tissue which would result speedily in a greater contraction than before unless careful and systematic after-treatment is followed out.

"Congenital stenosis of the meatus, and strictures of this region, if small enough to interfere with treatment, must be cut; they never yield to dilatation.

"Strictures of the pendulous urethra, if recent and soft, may yield to dilatation, and this method of treatment should always be given a fair trial, but if old and fibrous, will usually require cutting. Otis' dilating urethrotome has been the most satisfactory instrument for this purpose, in my hands. One may cut to the desired caliber with much precision. Do not do more than is necessary. Cut a little, introduce the bulb, and if the obstruction is not relieved, cut again. Albarran recommends four slight incisions at different points in the circumference.

"Strictures of the pendulous urethra possess an astonishing tendency to recontraction, so that the greatest perseverance is required after operation to maintain the proper caliber.

"Strictures from the penoscrotal angle to the bulbomembranous junction, unless traumatic, if passable, never need cutting.

"If it is possible to pass a whalebone filiform it will almost invariably be found that by gentle persistent efforts dilatation may be carried to the normal caliber. In the cases that will admit a filiform only, the instrument should be securely tied and allowed to remain in. This results in twenty-four hours in sufficient dilatation to permit of the introduction of a second or even a third filiform. These are in like manner retained, and in the course of one or two days all but one may be removed, and a Gouley tunneled catheter may be passed over this and allowed to remain, the filiform being withdrawn. After a few days a sufficient dilatation may be obtained to begin the gradual dilatation by steel bougies; or if not, a larger Gouley may be introduced. During all this time the patient must be given urinary antiseptics, and irrigation of the urethral canal should be practiced.

"As soon as a caliber of fifteen or thereabouts has been reached, gradual dilatation may be begun in the usual way. The frequency of the treatment and the size of the instrument to be used depend on the conditions present. Sufficient time should be allowed between each treatment to permit the reaction caused by the stretching to fully subside. If the stricture is soft and yielding, the instrument may be rapidly increased in size. On the other hand, if the deposit is very fibrous and resistant, the same numbers may properly be used at two or three successive treatments. It is very undesirable to increase the numbers too rapidly, as this results in laceration with the formation of new deposit and adds to the probability of contraction in the future. For this reason, I disapprove of the rapid dilatation, or divulsing, as it is called. While this method appears to yield brilliant results at the time, it is not entirely free from danger, and my experience has been that such patients are much more apt to return in future years for a recurrence of the stricture than those who have undergone the gradual method of treatment over a longer period.

"A patient who has been treated for stricture must be impressed with the fact that it may return in spite of the very best treatment, and hence he should visit his physician from time to time for an examination, or for the introduction of a bougie, in order to detect the earliest stages of any recurrence. If this is not done, the condition may become so pronounced as to require a prolonged and systematic treatment, as in the first case."

Paresthesia.

Dr. John V. Shoemaker, Philadelphia, in the *Medical Bulletin*, June, 1907, recommends the following prescriptions to ameliorate the nervous disturbances of the skin that sometimes occur in patients suffering from neurasthenia:

R.	gm.	
Arseni trioxidi	103	gr. ½
Ferri lactatis	2	gr. xxx
Zinci valeratis	1	or
Asafœtidæ	1	
Extracti sumbul	1	ää gr. xx

M. et fac capsulas 20. Sig.: A capsule three times a day, after meals and at bedtime.

The capsule at bedtime had best be taken with some light food, as milk, crackers and water, some simple fruit, or a cup of one of the simple convalescent foods, as malted milk. These patients are generally sleepless and some simple food, especially if taken warm, aids them in getting to sleep. Also the above capsule (and it is true of most drugs in pill, capsule or tablet), should not be taken on an empty stomach, even with water.

As a local application Shoemaker recommends the following:

R.	gm. or c.c.		
Magnesii carbonatis	2		3ss
Creosoti	2		℥ss
Glycerini	30	or	℥i
Liquoris calcis	100		℥iii
Aquæ hamamelidis	ad 200		ad ℥vi

M. Sig.: Shake well, and apply to the irritated skin.

An Antiseptic Gargle.

Dr. Charles E. Souther, Cincinnati, recommends the following prescription "as an efficient gargle, especially in syphilitic sore throat and as a prophylactic for those who are nursing patients with diphtheria:"

R.	gm. or c.c.		
Hydrargyri chloridi corrosive	10		gr. ii
Alcoholis	30	or	℥i
Glycerini	30		℥i
Aquæ destilatæ	ad 500		ad ℥xvi

M. Sig.: Use as a gargle every three or four hours.

For Diarrhea in Children.

R.	gm. or c.c.		
Benzosulphinidi	01		gr. 1/6
Olei menthæ piperitæ	03	or	gr. 1/2
Alcoholis q. s. ad solutionem			q. s.
Adde olei ricini	ad 25		℥vi

M. Sig.: One or two teaspoonfuls, according to age.

Follow this with:

R.	gm. or c.c.		
Bismuthi subgallatis	500	or	gr. lxxv

Fac chartulas 20. Sig.: One powder every two hours.

The following combinations are recommended by Daniel E. Hughes, M.D.:

R.	gm. or c.c.		
Pulveris ipecacuanhæ	15		gr. ii
Pulveris rhei	10	or	gr. iss
Sodii bicarbonatis	25		gr. iv
Sacchari	1		gr. xv

M. et fac chartulas 4. Sig.: One powder every four hours.

Follow with this:

R.	gm. or c.c.		
Bismuthi subnitratis	8	or	3ii
Phenylis salicylatis	2		3ss

M. et fac chartulas 20. Sig.: One powder every two hours.

Or this, if there is pain:

R.	c.c.		
Tincturæ opii deodorati	5		℥i
Spiritus chloroformi	10	or	℥ii
Acidi sulphurici diluti	25		℥v
Vini pepsini (N. F.)	ad 100		℥iii

M. et sig.: One teaspoonful, in water, every three hours.

If there is vomiting use the following:

R.	gm.		
Hydrargyri chloridi mitis	05		gr. i
Sodii bicarbonatis	1	or	gr. xv
Sacchari	1		gr. xv

M. et fac chartulas 8. Sig.: One powder, given dry on the tongue, every hour till vomiting is controlled.

Cardiac Dilatations.—C. R. Sowder, Indianapolis, in the *Central States Medical Monitor*, in an article on cardiac dilatations gives the following essentials of treatment: First, absolute rest in bed is needed for a time, followed by a life free from worry or excitement, and with moderate exercise, and good easily digested, nourishing food. Strict attention must be given to the eliminative organs. Second, the drugs used are digitalis, for the heart, and strychnin and iron for the anemia. If possible, of course, the cause of the dilatation must be removed.

Pharmacology

PROBILIN.

Report on Probilin by the Council on Pharmacy and Chemistry —With Comments.

The following report has been submitted to the Council on Pharmacy and Chemistry by a subcommittee to whom Probilin was assigned (Pilulæ Probilinæ. Dr. W. Bauermeister. Goedecke & Co., Leipzig, Germany. Schering & Glatz, New York, sole agents for the United States):

To the Council on Pharmacy and Chemistry:—Probilin pills are said to be made according to a formula published by Dr. W. Bauermeister in *Therapeutische Monatschrift*, May, 1904. In a circular published by the American agents, Schering & Glatz, the statement is made that each pill contains 1½ grains of salicylic acid and acid sodium oleate. The circular accompanying each package of Probilin reads as follows: "They are a combination of salicylic acid with acid sodium oleate to which sufficient phenolphthalein and menthol have been added to stimulate the gastrointestinal tract mildly and to insure tolerance."

A more complete formula appeared in an article by Reynold Webb Wilcox, M.D., LL.D., of New York, in The Journal of the American Medical Association, Aug. 4, 1906. Inasmuch as this article was reprinted, in a garbled form, and circulated by Schering & Glatz, and as they indicate, both in the body of the article and in the footnote, that the preparation referred to by Dr. Wilcox was Probilin, one is naturally justified in assuming that the detailed formula as published by Dr. Wilcox is the formula claimed by the manufacturers of the product or, at least, by their American agents. This formula is as follows:

Acid sodium oleate	1½ grains.
Acid salicylic	1½ grains.
Phenolphthalein	1 grain.
Menthol	¼ grain.

Mix and make into one pill.

The active ingredients in the above formula would make a pill that would weigh approximately 275 mg. or 4¼ grains, without the addition of any excipients, dusting powder or moisture. But on weighing a number of Probilin pills, taken from an original package purchased in the open market, they were found to weigh approximately only 210 mg. each. While each of the four active constituents mentioned in the formula is soluble in alcohol, it was found that when Probilin pills were extracted with alcohol only 150 mg. per pill would dissolve. As this indicated a shortage of nearly 50 per cent. and demonstrated that the published formula was not correct, your committee deemed it of interest to the profession to determine the true composition of these pills. Accordingly, Probilin pills were submitted to a chemist, who makes the following report, further emphasizing the falsity of the published formula:

As per yours of December 22, we have made an analysis of Probilin pills bought in the open market by ourselves, and find the approximate composition of each pill to be as follows:

Phenolphthalein	.008 gram.
Sodium salicylate	.010 gram.
Sodium oleate and free oleic acid	.100 gram.
Menthol	.010 gram.
Moisture	.006 gram.
Dusting powder	.065 gram.

The dusting powder seems to have been made up of lycopodium, licorice and charcoal.

The results given, while approximate, are as close, we believe, as it is possible to make an analysis of this nature.

The average weight per pill is 3 1/16 grains; the heaviest of the dozen pills weighed was 3 3/16 grains, and the lightest 2 7/8 grains. The bottle contained seventy pills.

It is of course impossible to tell in a mixture of this kind whether the salicylic acid is positively free or positively combined. The fact is that the alkali present is sufficient approximately to neutralize the acids found. While the pill is normally acid in reaction, the total acidity would correspond only to 1/6 of a grain of salicylic acid, so that it will be seen that, even if the entire acidity were attributed to salicylic acid, it is not sufficient to account for the presence of the amount claimed in the formula, without reference to the claim that it also contains an acid sodium oleate. Since free salicylic acid reacts with sodium oleate to form sodium salicylate and free oleic acid, we feel justified in concluding that the pill contains sodium salicylate, sodium oleate and a small amount of free oleic

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acid. You will note that the total amount of material claimed in the formula of the circular is 4¼ grains of active constituents in each pill. You will note that the average weight of each pill, as found by us, is 3 1/16 grains; this includes one grain of the dusting powder, which was actually separated and weighed, and identified as to its general nature. If, therefore, this one grain is deducted from the 3 1/16 grains it will leave 2 1/16 grains for the active principles of the pill. From this also should be deducted the 1/8 of a grain of moisture, leaving less than 2 grains of medicinal ingredients, instead of 4¼ grains, as stated in the formula.

This analysis was confirmed in all essential points by another chemist.

It is evident that Probilin, as at present marketed in this country, does not comply with Rules 1, 4, 5 and 8 of the Council. It is, therefore, recommended that Probilin be refused recognition. It is further recommended that this report be published in THE JOURNAL of the American Medical Association.

The report was adopted by the Council.

W. A. PUCKNER, Secretary.

COMMENTS.

The above report is not creditable either to the manufacturer of this product or to the American agents, nor is it particularly gratifying to American physicians or pharmacists. Probilin seems to be an excellent example of a certain class of "made in Germany" nostrums, to which physicians have given altogether too liberal an endorsement, principally, perhaps, because it is not always easy to differentiate between the good and the bad products, which are advertised as having the endorsement of German scientists. The principal point in the above report is so simple that even a child could understand it. The active ingredients, according to the formula circulated by the American agents amount to 275 mg. or 4¼ grains per pill. The pill, as found on the market, weighs only 210 mg., of which only 150 mg. are active constituents. It is evident, therefore, that the pill can not contain what the formula calls for. In other words, if the formula for Probilin pills as given by Wilcox and published by Schering & Glatz is correct, the pills would weigh much more than they do weigh.

It is rather disconcerting to our pride as American physicians to note that this nostrum is evidently made especially for the American market, since careful research through German text-books, lists of new remedies, price lists of German wholesale druggists, etc., fails to reveal any evidence that this preparation is used and recognized in the land of its origin. One naturally asks: Are German physicians too careful to be decoyed into the use of pills, which have an actual weight of only three-fourths the amount of the active ingredients indicated by the published formula?

Another fact is worthy of mention. The American agents for Probilin lay great emphasis on the fact that these pills are difficult to prepare. This is unquestionably true, for if the formula as circulated by them is followed it is not only difficult but impossible to dispense them, since a soft, pasty mass would result, from which it would be impossible to make pills without the addition of other substances. It is, however, a simple matter to make pills having the composition of the Probilin pills as they are sold by Schering & Glatz. Neither will there be any difficulty in making the pills if the substances as recommended in German journals, only garbled accounts of which have been published in this country, are directed to be used. In this respect Probilin resembles Campho-Phenique, which was discussed in THE JOURNAL not long ago (April 20, 1907, p. 1365). In both instances an endeavor to compound the preparation from the formula furnished resulted in failure to produce anything like the product advertised.

In conclusion, there is another very important fact which Probilin illustrates. A physician, relying on false formulas furnished by proprietary medicine companies, is often led to false conclusions regarding the dosage and effectiveness of certain drugs. In prescribing Probilin he is led to believe that he is administering one grain of phenolphthalein to each pill, when, according to the analyses, he is giving only one-eighth of a grain. If, now, he desires to prescribe phenolphthalein in some other form, he naturally follows the experience (?) which he thinks he has gained from its use in Probilin. He, therefore, orders phenolphthalein in doses based on the amount which he thinks he gave before, and thus gives eight times as much as he really had been giving in the form of Probilin. This is not only a hindrance to scientific progress, which is always based on truth, but it may lead to serious if not fatal injury. Aside, therefore, from the question of honesty or dishonesty on the part of the manufacturers, is the positively harmful influence on rational progress in medicine that results from deceptive and misleading statements regarding the quantities contained in various preparations.

The Active Principle of Ergot.

A chemical and physiologic study of ergot has been carried out at the Wellcome Physiologic Research Laboratories by George Barker and H. H. Dale (*Bio-Chemical Journal*, 1907, ii, 240), which promises that the long search for the active principle of ergot may soon come to a successful end. Among the conclusions reached by these investigators are that the alkaloid ergotoxin represents the chief active constituent of ergot and that "clavin," recently exploited in Europe as a definite chemical body possessing the specific oxytocic action of ergot, but free from toxic effects, is a mixture of leucin and aspartic acid and is pharmacologically inert.

Since ergotoxin is insoluble in water the various aqueous extracts of ergot, ergotin, etc., as found on the market can contain but little of this alkaloid. As these aqueous extracts possess more marked pressor effect than can be accounted for by the small amount of ergotoxin present it is possible that ergot may contain a second stimulating principle. Barger and Dale conclude that of the physiologic effects described as characteristic of ergot, the alkaloid ergotoxin produces in very small dosage: (a) The effects ascribed by Kobert to sphaelinic acid, and by Jacobi to sphacelotoxin, viz.: Ataxia, dyspnea, salivation, gastrointestinal irritation, and gangrene. (b) The stimulant effect on plain muscular organs—in particular the arteries and the uterus—and the subsequent selective sympathetic motor paralysis given by many ergot preparations (Dale).

Ergotoxin ($C_{35}H_{41}O_6N_5$) is the hydrate of the crystalline alkaloid ergotinin (Tanret), $C_{35}H_{39}O_5N_5$. Ergotoxin is itself amorphous, but yields crystalline salts, and further differs from ergotinin in being very soluble in alcohol. Its most important difference, however, is its intense physiologic activity, ergotinin being but slightly, if at all, active when pure. Either alkaloid can readily be transformed into the other by chemical means.

In conclusion these investigators give their conception of the relation of the ergot alkaloids, ergotinin and its hydrate ergotoxin, to the various so-called "active principles" obtained by other experimenters from ergot. They conclude as follows: The ecbolin and ergotin of Wenzell is a mixture of alkaloids containing cholin. The amorphous ergotinin of Tanret is an impure mixture of ergotinin and ergotoxin. The picrosclerotin of Dragendorff is ergotinin, possibly mixed with ergotoxin. The sclerocrystallin of Podwyssotski is ergotinin. Kobert's sphacelinic acid is an inactive resin with adherent alkaloid. The cornutin of Kobert is an alkaloidal resin, probably containing some ergotoxin, and also some other active substance, which may be a decomposition product of ergotoxin. The cornutin of Keller is an impure mixture of ergotinin with ergotoxin. Jacobj's chrysotoxin is an inactive yellow coloring matter with a small proportion of adherent alkaloid. The secalintoxin of Jacobj is a mixture of ergotinin and ergotoxin, while Jacobj's sphacelotoxin is impure ergotoxin. Hydroergotinin, recently isolated by Kraft, is identical with ergotoxin.

Obesity Cures.

In prosecuting its work on the composition of certain secret remedies, the *British Medical Journal* (July 6 and 20) takes up the obesity cures. The advertisements of these remedies are more moderate in their claims than some other nostrum literature, for the reason that corpulence is so objective a fact that it will not do to make claims which would be specifily proved false. Still, some remarkable statements

are made, such as that a reduction can be noticed within twenty-four hours varying from 8 ounces to 3 pounds. The constituents of such mixtures usually are extract of bladder wrack (*Fucus vesiculosus*) and citric acid. In some the mixture of non-official, and even non-medicinal substances, with not well-defined chemical characteristics, renders an exact determination of the composition impossible. Antipon and Russel's Anticorpulent Preparation were found to contain nearly 40 grains of citric acid to the ounce. Absorbit Reducing Paste consisted approximately of purified ox bile, 5 per cent.; beeswax, 22 per cent.; lard, 44 per cent.; oil, 29 per cent.; with a small amount of carmin and a trace of perfume. J. Z. Obesity tablets contained sulphur, ginger, sugar and acacia. Hughes and Hughes XL Reducing Pills were found to have approximately the following composition in each pill:

Potassium iodid	0.15 grain.
Iron phosphate	0.35 grain.
Powdered ginger	0.2 grain.
Powdered liquorice	0.1 grain.
Extract of fucus vesiculosus	2.2 grains.

Hughes and Hughes Reducing Lotion, which is to be applied locally to the part where fat has accumulated, consisted of about 0.08 per cent. of an undetermined resinous substance, together with the following other ingredients:

Potassium iodid	9.7 grains.
Potassium bromid	13.5 grains.
Potassium chlorid	6.9 grains.
Glycerin	105. minims.
Water to 1 fluid ounce.	

As usual, the prices at which these remedies are sold are from 50 to 100 times the estimated cost of the ingredients.

Correspondence

The Bactericidal Value of Some Widely Adverstised Antiseptics.

PHILADELPHIA, Aug. 2, 1907.

To the Editor:—I am much interested in the investigations of Drs. Verhoeff and Ellis, reported in THE JOURNAL, June 26, in Messrs. Parke, Davis & Co.'s reply thereto, and in what may be called your defense of the former in THE JOURNAL, July 27, 1907, and it appears to me that Drs. Verhoeff and Ellis have permitted themselves to infuse an unwarranted element into their experiments, which entirely justifies the conclusion of Messrs. Parke, Davis & Co., that their "method of testing was faulty, and not at all comparable to the practical use of antiseptics."

Under all circumstances, experimental conditions should be made to approximate as near as possible the natural state under which the subject to be experimented on is to act; but in spite of this fundamental principle they inject an artificial condition into their experiments which neither they nor any one else have shown to exist in the natural state so far as my knowledge goes. What proof have they to assume that the antiseptics which they employed, on being introduced into the body, encounter an overwhelming quantity of serum? None, so far as it appears. What use is it, then, to take the fighting strength out of antiseptics by saturating them with hydrocele fluid, or serum albumin, which we know vitiates their action, before they are submitted to experiment? Why strangle their action at the very outset, and then draw the false deduction that they are practically inert and worthless? What would you think if any one would seriously propose to you the saturation, or even the mixing of peroxid of hydrogen with hydrocele fluid before applying it to a septic condition? I think I know your answer exactly.

I hope it is needless to assure you that the "vested interests" to which you refer, are of no concern to me, but I am mightily concerned whether our knowledge of, and faith in, our invaluable antiseptics which have been acquired by many years of patient toil, labor and money, should be despoiled by experiments which are faulty from their very inception?

After all is said and done, the question remains, whether germicides, antiseptics, antiferments, antizymotics, etc., produce their beneficial influence solely through the virtue of their germ-destroying property, or whether their fundamental action does not consist in depressing increased molecular or cell activity, which is incited by micro-organisms and other agencies; and whether they do not hold this fundamental property in common with antipyretics, febrifuges, etc. For a serious study of this whole field of therapuetics, forces the conviction that the action of these two groups of agents are closely affiliated in every particular, that antiseptics are in great part antipyretics, and that antipyretics are in great part antiseptics; and that, finally, the germ-destroying power of both groups, while a valuable index as to the degree of their antiseptic or antipyretic activity, but no evidence whatever that this is their therapeutic function when administered in disease, may be merely an incidental manifestation of their power to interfere with, and inhibit all forms of cell activity, and hence, to make a long story short, the fact that an agent which does not destroy germs within the body, is no proof that it is devoid of antiseptic properties. THOMAS J. MAYS.

Commercialism and Food and Drug Adulteration.

NEW YORK, Aug. 15, 1907.

To the Editor:—I am glad Dr. Bryant spoke in no uncertain terms regarding our need of honest drugs, in his presidential address before the American Medical Association at its recent meeting in Atlantic City. For the last four or five months, as American correspondent of several medical journals published in Spain, Mexico, Central and South America, I have been telling the same thing to the physicians and druggists of Spanish America, and also warning them about the loophole in the new Food and Drugs Act, now in force here in the United States since Jan. 1, 1907, by which: (*a*) "Food products intended for export may contain added substances not permitted in foods intended for interstate commerce, when the addition of such substances does not conflict with the laws of the country to which the food products are to be exported, and when such substances are added in accordance with the directions of the foreign purchaser or his agent;" (*b*) "the exporter is not required to furnish evidence that goods have been prepared or packed in compliance with the laws of the foreign country to which said goods are intended to be shipped;" (*c*) "food products for export under this regulation shall be kept separate and labeled to indicate that they are for export;" and (*d*) "if the products are not exported they shall not be allowed to enter interstate commerce." These are the provisions of Regulation 31, concerning the preparation of food products for export. In consequence of this authoritative permission, all the impure food products, chemicals, drugs and pharmaceutical preparations not allowed for interstate commerce here in these United States of North America, are now being unjustly unloaded in the Spanish-speaking countries not having laws to prevent it. As a matter of curiosity, it would be instructive to compare that regulation with Regulation 32, concerning the requirements of food products and drugs when they are to be imported into these United States.

A. M. FERNANDEZ DE YBARRA, M.D.

The Parabolic Reflector for Illumination of Test Types.

SOUTH HAVEN, MICH., Aug. 7, 1907.

To the Editor:—I take exception to the article with the above title in THE JOURNAL, Aug. 3, 1907, page 383. It is evident that Dr. Frank has left out of consideration the direct rays of light. On page 384, from Figure 2, the following distances in feet are obtained:

AD 3.25	AC 2.50	DF 2.31
FC 2.43	FA 3.99	FB 3.14

The direct illumination is approximately in the following proportion: (3.99)2 at C, (3.14)2 at B, and (2.43)2 at A. The direct illumination covers an angle of about 37.5 degrees and the indirect an angle of 225 degrees or six times the direct.

Supposing the mirror to be nearly perfect, with little light lost by absorption, we get the following illuminating values:

At B, $6+1=7$. At A, $6+\frac{(2.43)2}{(3.14)2}=6.6$. At C, $6+\frac{(3.99)2}{(3.14)2}=7.62$.

This gives an excess of light at C over A of more than 15 per cent. If Dr. Frank will place an additional reflector below

the test type at the corresponding angle he will have an illumination that is within 1 per cent. of accuracy.

BEN WEBSTER.

Sanguinaria in Eczema.

ROYERSFORD, PA., Aug. 8, 1907.

To the Editor:—For a number of years I have been using in my practice local applications of fluid extract of sanguinaria (Fluidextractum Sanguinariæ, U. S. P.) in the treatment of obstinate cases of eczema. It has given successful and gratifying results, especially in the squamous and papular varieties of eczema. It is well sometimes, in order to facilitate treatment, to puncture the papules with some sharp instrument.

In cases of eczema secondary to varicose ulcers of the leg, "salt rheum," this remedy has been especially beneficial. It is applied boldly, freely and persistently by repeated paintings of the part or by means of cloths, gauze, etc., saturated with the solution, which may be used in varying strengths.

The only literature which I have seen on this use of sanguinaria is in the U. S. Dispensatory, twelfth edition, where, under sanguinaria, it is stated that an infusion with vinegar has been found useful in obstinate cases of cutaneous diseases. A somewhat similar note appears in the subsequent editions.

I shall be pleased to learn of the experience, if any, of other physicians with this preparation in the treatment of eczema.

J. D. GRABER, M.D.

Jeweler's Eyeglass in Office Examination and Treatment.

HONOLULU, T. H., July 23, 1907.

To the Editor:—I take the liberty of bringing to the notice of the profession a little aid which I have found of great service, the jeweler's eyeglass or loupe. One very readily acquires the ability to hold it in place, unconsciously, and I have found it of great value in epilation, searching for and removing foreign bodies from the cornea, etc. I have several glasses, but perhaps use a four-inch most often. It is surprising how often it will be of assistance about the office. The other eye being free, one can readily pick up instruments without disturbing the glass, and at the same time can have both hands free for the work in hand.

W. L. MOORE.

Pollantin in Hay Fever.

LOUISVILLE, KY., Aug. 2, 1907.

To the Editor:—I do not wish to stand in the position of exploiting new remedies, but the rather unfavorable comments on the new remedy "pollantin" in Dr. Curtis' paper in THE JOURNAL July 13 prompts me to say a few words in regard to my experience with it. The first pollantin I used was obtained from Dr. Dunbar direct, the year before it was placed on the market. The case I used it on was a particularly intractable one of some twenty years' standing, accompanied with severe asthmatic seizures.

The case is one of unusual interest and I desire to report it. The following is a record made three years ago: F. H., aged 50, mulatto, a widow, with no children, had no venereal, drug or alcoholic history. Her father died at the age of 76 years, of senility. Her mother is living, about 85 years old, suffers from occasional attacks of asthma during the winter, and has chronic bronchitis, but no hay fever. The patient is of spare build, fairly well developed, no bad habits, a hard-working, industrious servant. She had always enjoyed fairly good health up till 10 years ago when, as she says, she caught the hay fever and asthma by washing the soiled linen of a man who suffered from the disease. Certain it is that she has suffered ever since from a very severe and intractable form of this trouble. The attacks begin each year about August 15, in a typical manner. There is itching and burning of the nose and eyes, with excessive secretion, which renders the skin very red and sore. Asthmatic attacks are precipitated by heavy or cloudy weather or by eating after 3 p. m. Usually, after four or five days, she is compelled to take to bed and to remain from eight to sixteen weeks; for the disease persists till frost and it takes several weeks for the patient to gain strength sufficient to go to work. On three occasions she has had a complicating pneumonia that nearly proved fatal. I had seen this case for a number of years and had it in charge for the last five. Almost every form of treatment had been employed without avail. For the rest of the year the patient has no trouble and enjoys fairly good health. On examination of the upper air passages before the attack, no local signs can be discovered. The nasal passages are fairly spacious, though the turbinates are hypertrophied. Two years ago, by the following plan of treatment, I was enabled partially to control the disease. General tonic treatment commenced one month before the attacks. Local treatment: First, drop 1-5000 adrenalin solution in nose; second, douche chambers with warm saline solution; third, aboline ʒi, camphor, menthol, eucalyptol, ää gr. v. That season the patient was in bed only four weeks, the best she had done in eighteen years. For the asthmatic attacks, stramonium was chiefly employed. The next summer, on reading an abstract of Prof. Dunbar's work at the Hygienic Institute at Hamburg, I wrote him for serum sufficient for a case and information as to where it could be purchased in this country. The serum arrived about August 10, an odorless, pale yellow, impalpable powder, to be snuffed into nose and painted over conjunctiva as occasion demanded. Treatment was commenced August 12, three times a day, in conjunction with the local treatment of the year before. This controlled not only the symptoms of the hay fever but also the tendency to asthmatic seizures. Thus, for the first time in nineteen years, the patient passed through the month of August able to be up and at work. A mild attack of asthma, lasting four days, occurred September 1, and this was the only time lost during the whole season. Whatever may be the general efficacy of this remedy it certainly controlled the disease in this particular case and I desired to report it, first, on account of its long duration and severity; second, apparent history of contagion; third, absence of any other local disease; fourth, previous unavailing treatment by other methods and absolute control of the disease by the pollen antitoxin.

The only addition I have made to this treatment is the hypodermatic injection of suprarenalin for the relief of asthma that occasionally comes on during the season. This always controls the attacks, and as much as 15 minims of the 1-1,000 solution have been injected at one time without ill effects. The patient now regards the hay fever season with comparative little fear and during the last four years has not spent over two weeks in bed on account of it. My experience in this case gave me a very favorable impression of the new remedy and I have used it in many cases since and always with uniform satisfaction.

The point which I want to urge, however, and which in my opinion is essential to success, is the shrinking of the tissues with suprarenalin preliminary to insufflation of the pollantin. One of the earliest symptoms of the disease is a turgescence of the turbinated bodies, particularly the inferior turbinates which effectually block up the nose. Under these conditions if pollantin is used it will be without benefit, for the swollen condition of the turbinals will prevent the entrance of the powder beyond the vestibule. If the turbinals are first reduced, however, with a dilute solution of suprarenalin and the nose cleansed of its accumulated secretion, the powder can then be insufflated to the farthest recesses of the nasal chambers. It can not be urged that these cases were benefited by the suprarenalin preparations alone because the relief was always greater when pollantin was used in conjunction.

I do not regard it as a specific in the same sense that diphtheria antitoxin is considered. It does not constitute in my mind a single plan of treatment, but in conjunction with other remedies intelligently used it enables one to make these patients comfortable even during the height of the season.

GAYLORD C. HALL.

Medical Fees.—We spend about $5,000 on our medical education before we are entitled to practice, give five or six good years of our life to the study to qualify us, have to buy expensive books and instruments, and even after all this, to keep pace with the advance of science, must go periodically to the centers of medical education and continually be expending money. Surely a return in proportion is rightly expected.—*Western Canada Medical Journal.*

Miscellany

British Association for the Advancement of Science—The Alcohol Question.—This association met at Leicester, July 31. The address to the physiologic section was delivered by its president, Dr. Augustus D. Waller, who discussed the action of anesthetics. He referred to the attempts to determine the exact dosage of chloroform, and stated that he believes that in future death from chloroform will be considered an avoidable accident and that the frequency of such deaths will be diminished by a wider knowledge of the physiology of anesthesia. Dr. Waller described an apparatus by which a standard mixture of air and chloroform can be administered.

In the discussion, Dr. Frederick W. Hewitt said that it is impossible to apply the method of exact percentages to the administration of chloroform and that in many cases it is also impossible to instruct students wholly in that method. Individuality, he said, enters largely into the matter in practice; certain patients require a higher percentage of chloroform than others.

In the same section, Dr. A. R. Cushny, of the University of London, read a paper on the "Physiologic and Therapeutic Uses of Alcohol," in which he asserted that alcohol at times might increase the desire for food and encourage its digestion, but when moderation is departed from the whole digestive apparatus is disorganized. This paper was received with much interest and was discussed by a large number of prominent medical men.

Dr. Waller said that there are many kinds of alcohol and that their effect on the tissues differs, and described experiments to prove his statement.

Dr. Rivers pointed out that there are two problems: First, the determination of the effect, immediate or remote, after a single dose of alcohol; second, whether or not the continuous taking of alcohol as a habit has any effect on the ability to do muscular work. He related some experiments and urged the necessity for more research work along this line. He also said that on the mental side there is danger of the appearance of disturbing psychologic factors.

Dr. Dixon directed attention to the classification of alcohol as a poison, based on the results of experiments with protoplasmic tissue, and declared that he could similarly prove that distilled water, beef tea and caffein are poisons.

Sir Victor Horsley said that the scientific examination of alcohol should be an accurate determination of its so-called stimulating effects, and asked if such really exist, how soon the paralyzing and narcotic stage begins. He declared that Dr. Dixon's results can not be accepted until it is proved that the alcohol perfused through the tissues is used up. He said further that the well-known effect of alcohol in increasing the diastolic relaxation of the walls of the heart can not be regarded either as a stimulation effect or as an advantage to the circulation. He referred to the finding of the physical deterioration committee, appointed by the House of Commons, that the first great evil socially is defective housing, and that the second is alcohol, and said that for patriotic reasons abstinence should be the aim and practice of all men. The majority take alcohol for its pleasurable effects, and the only results are inefficiency, disease, poverty, crime and vice.

Mr. C. J. Bond exhibited a series of diagrammatic curves showing the diminished consumption of alcohol since 1845 and how it is intimately connected with the nation's commercial prosperity. He also referred to its effects on the number of inmates in asylums.

Dr. Reid Hunt, Washington, D. C., described a series of experiments on young guinea-pigs to which small doses of a few cubic centimeters of 5 to 10 per cent. alcohol solution were given in their daily food. Four generations (over a period of two years) grew just as quickly, reached maturity as soon, and were just as fertile as those to which no alcohol was given. There was never a symptom of intoxication, no loss of weight, and no pathologic changes. The comparison, he said, was analogous to human beings who are moderate drinkers. He said that no one seems to have discussed deeply the question of the increased tolerance for alcohol in the bodies of animals and men who had become accustomed to its presence. An increased power is produced on the part of the body to oxidize alcohol. In comparing sugar and alcohol, he stated that while sugar increases resistance to poison, alcohol lessens it. Most probably, he said, the continued use of alcohol produces physiologic changes in the body, sometimes for good and sometimes for evil.

Principles of Opsonic Theory.—The following chart is the one to which reference was made in the article by Sir Almroth E. Wright, in The Journal, Aug. 10, 1907, page 484. This

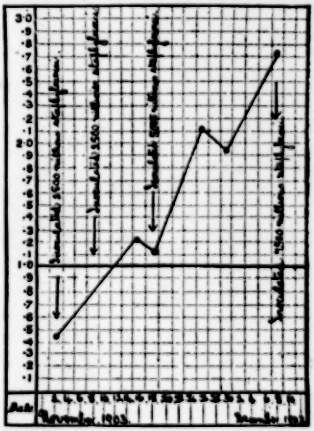

Fig. 1.—Immunization chart showing a typical illustration of the achievement of successful immunization.

chart was not received with the manuscript or in time to appear with the publication of the paper.

Relations of the Trifacial Nerve to Nasal Disease.—C. N. Cox (*Long Island Medical Journal*, July), calls attention to the fact that irritation of one branch of this nerve can create disease at the seat of distribution of another branch of the same nerve. Many cases of trifacial neuralgia may owe their origin, he declares, to suppuration of the accessory sinuses, although there may be extensive suppuration without any pain whatever. If, however, pus be found coming from any accessory sinus, in a patient suffering from trifacial neuralgia, in whom other causes are not manifest, the evidence is presumptive of the sinusal origin of the disease. No operation on the trifacial should be undertaken until disease of the accessory sinuses has been definitely excluded.

Book Notices

Lateral Curvature of the Spine and Round Shoulders. By Robert W. Lovett, M.D., Boston. Associate Surgeon to the Children's Hospital, Boston. Illustrated. Cloth. Pp. 185. Price, $1.75 net. Philadelphia: P. Blakiston's Son & Co., 1907.

Lovett's monograph on lateral curvature is in every way worthy of the attention of general practitioners, as well as of orthopedic specialists. Lovett treats the subjects comprehensively, without giving unnecessary space to the consideration of minutiæ of interest solely to specialists. The first chapter is devoted to the anatomy of the vertebral column and the thorax, which is presented in an interesting form, with a number of special cuts and tabulations. The movements of the spine, illustrated with photographs of the living model, as well as of the cadaver, showing the torso in various positions, are then considered. The mechanism of scoliosis, with cuts showing the results of experimental curvatures produced on

animals, and the description and symptoms and pathology of the condition are described, as is also the examination and methods of making records. Etiology and the influence of school conditions, frequency of occurrence, diagnosis, prognosis and treatment are successively considered, each chapter being freely illustrated.

POISONS: Their Effects and Detection. By Alexander W. Blyth, M.R.C.S., etc., and Meredith W. Blyth, B.A. (Cantab.), etc. Fourth Edition. Thoroughly Revised. Illustrated. Cloth. Pp. 772. Price, $7.50 net. London: Charles Griffin & Co. New York: D. Van Nostrand Co., 1906.

This work has been expanded in some parts and condensed in others, obsolete processes being left out and the more modern and exact methods introduced. The history of poisoning is given in an interesting introductory chapter and this is followed by Part II, which gives the general considerations of definition, classification, and modes of search. The rest of the work is devoted to the consideration of the specific poisons. The treatment is thorough, the symptoms and considerations which are of importance for the practitioner being given with especial fulness. A large amount of space is given to the poisons of animal origin such as ptomains, adnephrin, disease toxins, etc. An account of food poisoning is introduced and in other respects the book is brought fully up to date.

ATMOKAUSIS UND ZESTOKAUSIS Die Behandlung Mit Hochgespanntem Wasserdampf in der Gynaekologie. By Dr. Ludwig Pincus. Frauenarzt in Danzig. Zweite Verbesserte Auflage. Mit 33 Textfiguren und Tafelin. Paper. Pp. 371. Wiesbaden: Verlag Von J. F. Bergmann. 1906.

The devotion of a volume of 370 pages to a process comparatively little known in this country should attract the attention of American gynecologists. In this second edition the author has made several changes in the direction of improving the work. The general part has suffered very little change, but in the special part some chapters such as that on gonorrheal endometritis have been omitted, while others have been rewritten. The book has now the character of a text-book and it should prove a useful guide to an important therapeutic procedure.

ANESTHETICS. Their Uses and Administration. by D. W. Buxton, M.D., B.S., Member of the Royal College of Physicians. Fourth Edition. Cloth. Pp. 415. Price, $2.50 net. Philadelphia: P. Blakiston's Son & Co., 1907.

Dr. Buxton's authoritative manual has been revised and much of it rewritten. Special forms of apparatus for the dosimetric administration of chloroform are described in detail, and the subjects of general anesthesia by ethyl chlorid and anesthesia by spinal injection are fully considered.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF ORGANIZATION, CONTRACT PRACTICE, INSURANCE FEES, MEDICAL LEGISLATION, ETC.

Prosecution of Quack Doctors.

The *Ohio State Medical Journal* (August 15) gives an interesting account of how advertising quacks are put out of business in Clark County, Ohio. Announcing himself as Professor Ellsmere, the world's greatest clairvoyant, palmist and healer, an individual recently began advertising in the newspapers of Springfield, Ohio. The legislative committee of the Clark County Medical Society promptly called on him and informed him he must leave Clark County or he would be prosecuted for illegal practice of medicine. By the next day the professor had departed in search of a field not having a county society with an alert legislative committee.

Old Insurance Fees Restored.

The Union Central, the Equitable and the Fidelity mutual life insurance companies have recently advanced their medical examination fees to $5. Three weeks ago we noted the fact that the Mutual Life Insurance Company of New York had done likewise. We hope soon to be able to record the fact that all the standard companies have restored their medical examination fees.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish name or address will be faithfully observed.

DIAGNOSIS IN DIARRHEA OF OBSCURE CAUSE.

RUTLEDGE, TENN., Aug. 8, 1907.

To the Editor:—Please state in THE JOURNAL the best treatment for the following condition: Man, aged 31; weight, ten years ago, 170 pounds; has had for the last nine years a constant diarrhea, which seems to appear periodically every three days, with, at times between, no movement at all unless from a purgative. Up to the first appearance of the malady, he was in good health, a very hearty eater, and never had had typhoid or flux. He says that the condition started up just after being sick with la grippe. Green fruits of any kind are not digested. He has a cough which appears every morning on getting up and continues until after breakfast, then subsides. There is no history of tuberculosis. Very often he vomits his breakfast. He eats dinner and supper with great heartiness and retains them. He sleeps well. T. D. CLOUD, M.D.

ANSWER: A complete diagnosis of the case should first be made by examination of stomach contents after a test meal and by careful macroscopic and microscopic examination of the feces during the period of diarrhea, and also after administering the test diet of Schmidt. The fermentation test of Schmidt may throw some light on the nature of the changes which produce the diarrhea. An opinion may be formed by taking the reaction of the feces and observing their odor. If the reaction is acid and the odor sour, but not putrid, we may assume that there is fermentation of carbohydrates with production of fatty acids; on the other hand, if the reaction is alkaline and the odor putrid, decomposition of blood, mucus, or albuminous food residues has taken place and the irritating products are probably the cause of the diarrhea. The feces should be tested for occult blood, meat having been excluded from the diet for two days. If mucus be found in the passages, colitis may be assumed to be present, and if blood or pus is present, ulceration has probably occurred. The seat of the colitis or ulceration must be determined by physical examination and a consideration of the symptoms. If the mucus or pus is voided separately from the feces proper, the seat of the disease is probably in the lower part of the bowel, and in any case digital and ocular examination of the rectum should not be omitted. The case may be one of fragmentary constipation described by Boas. The treatment should be determined largely by the results of the examinations. If intestinal putrefaction is shown by the reaction and fermentation tests a diet containing little proteids and a larger amount of carbohydrates should be prescribed. Meat should be temporarily excluded from the diet and milk should be used freely or exclusively. All irritating substances should be excluded from the diet and if practicable a considerable amount of fat should be taken to render the feces bulky and slippery. The details of the dietetic treatment and the medicines appropriate to the condition can only be determined after a careful diagnosis has been made. It is unwise to prescribe drugs in such a case until we know what is the matter.

CUSHING'S METHOD OF USING LOCAL ANESTHESIA IN HERNIOTOMY.

NIAGARA, KY., Aug. 9, 1907.

To the Editor:—In THE JOURNAL, July 20, Dr. James F. Mitchell, in an article on "Local Anesthesia in General Surgery," refers to Cushing's method of herniotomy. Please publish the technic of this procedure in THE JOURNAL. R. H. MOSS.

ANSWER.—In the *Annals of Surgery*, vol. xxxi, p. 1, is an article by Dr. Harvey Cushing of Baltimore on "The Employment of Local Anesthesia in the Radical Cure of Certain Cases of Hernia, with a Note on the Nervous Anatomy of the Inguinal Region." Dr. Cushing's is not a new method of performing herniotomy, but a new method of rendering the inguinal region anesthetic for the performance of any variety of hernia operation when the administration of a general anesthetic for any reason does not seem advisable. In this article, the sensory nerves of the region are carefully studied; the peripheral areas of distribution mapped out and the course of the trunks and branches illustrated and described. The idea is to anesthetize the line of incision through the skin by injecting Schleich's solution, cut down on the nerve trunks and cocainize them, after which the operation may then be completed without pain. The steps of the operation as described by the author are condensed as follows:

It has been the custom to administer hypodermically 1/10 or 1/8 of a grain of morphin three-quarters of an hour before and to repeat this shortly before the operation. The skin in the line of the proposed incision is infiltrated with Schleich's cocain solution, and the incision may be immediately made through the linear wheal thus produced.

It is unnecessary and useless to attempt to anesthetize the pan-

niculus. If, however, throughout its whole length this incision is carried down to the aponeurosis unanesthetized fibers of the illohypogastric will be encountered in the superficial fat at the lower angle, together with one or two large veins, division of which is painful, so that anesthetization of the panniculus layer is here necessary, or else, as has been done on several occasions, the incision only at the upper angle may be carried down to the aponeurosis, which is then opened in the line of fibers from the external ring and the illohypogastric and inguinal nerves immediately cocainized with a 1 per cent. solution as they lie under it. After this procedure the lower angle of the incision may be painlessly carried down to the external ring and the remaining intercolumnar fibers of the aponeurotic insertion divided. Under ordinary circumstances there is no further need of the anesthetic, as we are working in an area freed from all sensation.

The combined illoinguinal and genital nerve which has been cocainized at the outer limit of its exposure, is now reflected to one side or the other, care being taken not to divide it, since this leads apparently to a more or less permanent paralysis of the cremaster, which is to be avoided. The remainder of the operation, the exposure of the sac and cord after a longitudinal division of the infudibuliform fascia, the amputation of the sac at its neck, and closure of the peritoneal opening, the excision of the fundus of the sac, division of the cord and castration, if deemed advisable, may now be done practically without pain. The closure of the parietes by any of the more commonly employed methods may now be painlessly accomplished.

It occasionally happens during the operation, whether from slight ability on the patient's part to endure discomfort or from the accidental division of some sensory fibers, that what inhibition toward pain he at first may have possessed becomes exhausted and recourse must be had to a general anesthetic.

Under these circumstances it has been found that a few inhalations of chloroform—not enough, however, to make the patient lose consciousness—are sufficient to tide him over the most difficult parts of the operation.

The method of anesthesia which is employed may justly be spoken of, therefore, as a morphin-cocain-chloroform combination, the first and last drugs being merely adjuvants of the local anesthetic, which in many cases suffices alone.

COMPOSITION OF GONOCOCCIDE.

CHICAGO, Aug. 1, 1907.

To the Editor:—Can you give me any information about the composition of the preparation known as "Gonococcide," sold by Cox Chemical Co., Chicago? The circular accompanying the package gives the following formula:

C_8H_8BrNO monobromacetanilid; $C_{16}H_{18}N_2C_7HO_3$ eudermol; $CaSo_3.2H_2O$ gypsum and selenite, $CaSo_4$ anhydrite; H_2O aqua and myrrh.

NOTE.—In combining calcium coral with sulphuric acid, calcium occurs as gypsum, selenite and anhydrite.

The literature of eudermol limits the usefulness of that drug to skin diseases. W. H.

ANSWER.—Gypsum, selenite and anhydrite are the names applied to different forms of calcium sulphate. Gypsum and selenite are chemically identical, being calcium sulphate and containing two molecules of water crystallization, $CaSO_4 + 2H_2O$, but differing in crystaline form. Anhydrite is also calcium sulphate, but contains no water of crystallization. The inclusion of three different forms of the same substance should be sufficient to demonstrate the "fakiness" of the formula. The first substance named, monobromacetanilid, has been used as an antiseptic under the trade names antisepsin and asepsin. It is practically insoluble in water, and hence but little of it can be contained in the preparation. Eudermol is a name given to nicotin salicylate and its use externally has been recommended in scabies, chronic eczema, and other skin diseases. This being practically the only medicinal constituent given in the formula, its determination in gonococcide was taken up in the Association laboratory. Tests, however, failed to show the presence of this or any other alkaloid. While the addition of iodin to a 0.1 per cent. nicotin salicylate solution produces an abundant precipitate, the addition of iodin to a specimen of gonococcide produced no reaction whatever. Further comment on the formula seems to be unnecessary.

HOW FAR X-RAY PICTURES MAY AID IN TREATMENT OF MULTIPLE FRACTURES OF FEMUR.

DETROIT, Aug. 6, 1907.

To the Editor:—X-ray shadows may be useful in two ways: (a) By giving us some detailed knowledge of the degree of damage—comminution, laceration and complication—incident to the broken femur, which may not have been determined by inspection, touch and manipulation; (b) They may intrench us more securely before a jury. But is the knowledge thus obtained of more value in the treatment of the case than that obtained by a strict estimate by touch and manipulation of the resistance of the broken and torn tissues to the restraining devices—splint, etc.? There is a manifest tendency in some quarters to employ the Roentgen pictures as a routine practice in these fractures and I would like to have some one tell the readers of THE JOURNAL what he thinks the rule should be. H. C. WYMAN.

PRESCRIBING OF PHOSPHORUS.

HAMBURG, ARK., Aug. 12, 1907.

To the Editor:—Will you please criticise the following prescription and answer under Queries and Minor Notes whether or not the prescription is entirely safe and compatible?

℞ Quininæ hydrochloratis ..... ℈i
Nucis vomicæ ..... ℥vi
Spiritus phosphori (N. F.) ..... ♏iv
Elixir aromatici q. s. ad ..... ℥viii
M. Sig.: One teaspoonful in water three times a day.

W. S. NORMAN.

ANSWER: The prescription which you submit makes a fairly satisfactory preparation. The only objection to be made is the inclusion of spirits of phosphorus. The tendency of phosphorus to go into combination is so marked that the free phosphorus contained in the mixture will react with constituents of the same to form a compound of phosphorus. If your purpose is to give phosphorus it would be preferable to give it alone—as, for instance, the phosphorus pill of the U. S. Pharmacopeia.

SOME RECOVER FROM HAY FEVER.

MARCELINE, MO., Aug. 12, 1907.

To the Editor:—Are there any records of recovery from hay fever in patients who have had the disease several years? Of course many patients move to a different climate and escape the attacks, but I have never known a patient to recover in this state.

OLA PUTMAN.

ANSWER.—Our correspondent is right in viewing hay fever as a most stubborn disease, annually recurring and generally resisting treatment. Change of climate may result in prompt cure. But there are some patients who, without change of climate, with merely the ordinary local and symptomatic treatment, gradually outgrow their susceptibility and apparently acquire an immunity; they are able to live in the same place, amid the same surroundings, and are still free from the recurring attacks. The experience of many physicians who have had the opportunity of treating a large number of cases of hay fever will bear out this statement.

The Public Service

Army Changes.

Memorandum of changes of stations and duties of medical officers, U. S. Army, for the week ending Aug. 17, 1907:

Cowper, Harold D., asst.-surgeon, granted one month's leave of absence with permission to apply for two month's extension.

Keefer, Frank R., surgeon to accompany Ninth Infantry from Presidio of Monterey, Cal., with troops in field.

Ives, Francis J., surgeon, to accompany Ninth Infantry from Presidio of San Francisco to Fort Sam Houston, Tex.

Bartlett, C. J., asst.-surgeon, left Cuba en route to the United States on thirty days' leave of absence.

Nichols, Henry J., asst.-surgeon, is detailed as a member of board of medical officers for studying tropical diseases as they exist in the Philippine Islands, vice Craig, Charles F., asst.-surgeon U. S. Army, hereby relieved.

Vose, William E., asst.-surgeon, relieved from duty in the Philippine Islands, to sail from Manila, P. I., about Oct. 15, 1907, for San Francisco, and on arrival report by telegraph to the Adjutant General of the Army for further orders.

Banister, William B., surgeon, detailed member of the examining board at Manila, P. I., for the examination of such officers of the medical department as may be ordered before it to determine their fitness for promotion or advancement, vice Captain Thomas S. Bratton, asst.-surgeon, U. S. Army, hereby relieved.

Field, Peter C., asst.-surgeon, ordered to accompany Troops F and G, Fourth Cavalry, from San Francisco to Fort Snelling, Minn., and then to proceed to and take station at Fort Wayne, Mich.

Kilpatrick, Thomas C., asst.-surgeon, granted one month and eleven days' sick leave of absence. Relieved from treatment at the Army General Hospital, Washington Barracks, D. C., to take effect on the expiration of the sick leave of absence, and will proceed to join his proper station.

Byrne, Charles B., asst.-surgeon general, ordered to report in person to commanding general, Department of the East, Governor's Island, N. Y., for duty as chief surgeon of that department.

Davis, William B., deputy surgeon general, relieved from duty as chief surgeon, Department of the East, and ordered to report in person to the commanding general, Department of the Missouri, Omaha, for duty as chief surgeon of that department.

Banister, John M., deputy surgeon general, relieved from temporary duty as chief surgeon, Department of the Missouri, Omaha, and to return to station, Fort Riley, Kan.

Davis, William B., deputy surgeon general, Richard, Charles, surgeon, appointed members of an army retiring board to meet at Governor's Island, New York.

Krebs, Lloyd Le R., asst.-surgeon, granted leave of absence for one month, effective Sept. 1, 1907.

Halloran, Paul S., asst.-surgeon, granted one month and fifteen days' leave of absence.

Chamberlain, George E., contract surgeon, ordered from South Newbury, Vt., to Fort Walla Walla, Wash., for duty.

Barney, Fred M., contract surgeon, granted leave of absence for one month.

Phelan, Henry du R., contract surgeon, left transport Crook and arrived at Fort Baker, Cal., for duty.

Hutson, T. Ogier, contract surgeon, ordered from Fort Moultrie, S. C., to the Army and Navy General Hospital, Hot Springs, Ark., for treatment.

Hammond, William G., detail surgeon, ordered to visit in succession Whipple Barracks, Ariz., Fort Huachuca, Ariz., Fort Apache, Ariz., and Fort Wingate, N. M., for professional duty.

McAlister, John A., dental surgeon, ordered from Fort Wayne, Mich., to Fort Brady, Mich., for duty.

Navy Changes.

List of Changes in the Medical Corps, U. S. Navy, for the week ending Aug. 17, 1907:

Hough, E. P. W., acting asst.-surgeon, ordered to naval hospital, Annapolis, Md.

Stuart, A., P. A. surgeon, detached from command of the naval hospital, Sitka Alaska, and ordered home to await orders.

Grieve, C. C., P. A. surgeon, detached from the navy yard, Portsmouth, N. H., August 31, and ordered to command the naval hospital, Sitka, Alaska.

Owens, W. D., asst.-surgeon, ordered to the navy-yard, Portsmouth, N. H., and to additional duty on the *Southery*, August 21.

Taylor, E. C., P. A. surgeon, detached from duty at the navy recruiting station, Memphis, Tenn., and ordered home to wait orders.

Zalesky, W. J., P. A. surgeon, ordered to the navy recruiting station, Memphis, Tenn.

Biello, J. A., ordered to the naval hospital, Philadelphia.

McMahon, J., pharmacist, detached from duty at the navy-yard, New York, N. Y., and ordered to the naval hospital, Norfolk, Va.

Lung, G. A., surgeon, detached from the *Kentucky* and ordered home to wait orders.

Alfred, A. R., surgeon, detached from duty at the navy recruiting station, Pittsburg, Pa., and ordered to the *Wolverine*.

Stoops, R. E., asst.-surgeon, ordered to the navy recruiting station, Pittsburg, Pa.

Grunwell, A. D., surgeon, detached from the *Wolverine* and ordered to the *Kentucky*.

Melhorn, K. C., acting asst.-surgeon, ordered to the naval hospital, Norfolk, Va.

Blakeman, R. S., P. A. surgeon, discharged from treatment at the naval hospital, Norfolk, Va.

Public Health and Marine-Hospital Service.

List of changes of stations and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ended Aug. 14, 1907:

Geddings, H. D., asst. surgeon general, directed to proceed to Ellis Island, N. Y., for special temporary duty, on completion of which to rejoin his station in Washington, D. C.

Cofer, L. E., P. A. surgeon, granted leave of absence for one month.

Grubbs, S. R., P. A. surgeon, granted leave of absence for one day, Aug. 11, 1907.

Francis, Edward, P. A. surgeon, directed to proceed to Mobile, Ala., for special temporary duty, on completion of which to rejoin his station at Mobile quarantine station.

Collins, C. L., asst.-surgeon, granted leave of absence for one day, Aug. 16, 1907.

Olsen, E. T., asst.-surgeon, granted leave of absence for one month and twenty-eight days, from Aug. 18, 1907.

Miller, W. W., asst.-surgeon, relieved from duty at Ellis Island, N. Y., and directed to report at the Bureau in Washington for temporary assignment to the Hygienic Laboratory.

Gibson, L. P., acting asst.-surgeon, granted leave of absence for eight days, from Aug. 8, 1907.

Gustetter, A. L., acting asst.-surgeon, granted leave of absence for thirty days from Sept. 1, 1907.

Hunter, S. R., acting asst.-surgeon, granted leave of absence for six days, from Aug. 7, 1907.

McGinnis, R. H., acting asst.-surgeon, granted leave of absence for thirty days from Sept. 1, 1907.

Nute, A. J., acting asst.-surgeon, granted leave of absence for twenty days, from Aug. 20, 1907.

Rodman, John C., acting asst.-surgeon, granted leave of absence for three days, from Aug. 8, 1907.

Safford, M. V., acting asst.-surgeon, granted leave of absence for four days, from July 15, 1907, on account of sickness.

Safford, M. V., acting asst.-surgeon, granted leave of absence for four days, from Aug. 8, 1907, under Paragraph 210, Service Regulations.

Simonson, G. T., acting asst.-surgeon, granted leave of absence for ten days, from Aug. 5, 1907.

Walkley, W. S., acting asst.-surgeon, granted leave of absence for six days, from Aug. 18, 1907.

PROMOTIONS.

Stimson, A. M., Rucker, W. C., and Ward, W. K., asst.-surgeons, commissioned as P. A. surgeons, to rank as such from July 27, 1907.

Trask, J. W., asst.-surgeon, commissioned as P. A. surgeon, to rank as such from Aug. 16, 1907.

APPOINTMENTS.

Drs. Charles W. Chapin, Edward R. Marshall, Raymond B. Scofield, and Emil Krulish, commissioned (recess) as asst.-surgeons in the Public Health and Marine-Hospital Service, Aug. 8, 1907.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon-General, Public Health and Marine-Hospital Service, during the week ended Aug. 16, 1907:

SMALLPOX—UNITED STATES.

California: Los Angeles, July 20-27, 1 case.
Indiana: Elkhart, July 27-Aug. 3, 1 case; Indianapolis, July 28-Aug. 4, 2 cases.
Louisiana: Shreveport, July 27-Aug. 3, 3 cases.
Missouri: St. Joseph, July 27-Aug. 3, 1 case.
New Jersey: Newark, July 27-Aug. 3, 3 cases.
New York: New York, July 20-27, 1 case, 1 death.
Wisconsin: Milwaukee, July 27-Aug. 3, 2 cases.

SMALLPOX—FOREIGN.

Africa: East London, June 29-July 6, 1 case (imported).
Argentina: Rosario, May 1-31, 19 deaths.
Austria: Vienna, July 13-20, 1 case, 1 death.
Canada: Halifax, July 27-Aug. 3, 3 cases.
China: Manchuria, June 29-July 6, 2 cases.
Ecuador: Guayaquil, July 6-20, 2 deaths.
France: Paris, July 13-20, 15 cases, 2 deaths.
Greece: Piraeus, July 20-27, 1 case.
India: Calcutta, June 22-29, 2 cases.
Italy: July 11-18, 14 cases.
Java: Batavia, June 22-29, 3 cases.
Mexico: Aguas Calientes, July 27-Aug. 3, 2 deaths.
Portugal: Lisbon, July 13-20, 6 cases.
Russia: Moscow, June 29-July 20, 11 cases, 4 deaths; Riga, July 13-27, 4 cases.
Siberia: Vladivostock, June 4-14, 2 cases.
Turkey: Bagdad, June 22-29, present; Bassorah, June 29-July 6, present; Constantinople, July 14-21, 2 deaths.

YELLOW FEVER.

Cuba: Alacranes, Aug. 9, 1 case; Cienfuegos, Aug. 3-14, 14 cases, 1 death (9 cases among American troops); San Nicolas, Aug. 8, 1 case.

CHOLERA.

India: Calcutta, June 22-29, 68 deaths; Kashmir, June 22-29, 840 cases, 723 deaths.
Straits Settlements: Singapore, June 8-15, 2 deaths.

PLAGUE—UNITED STATES.

California: San Francisco, Aug. 12-14, 3 cases, 1 death.

PLAGUE—FOREIGN.

Australia: Brisbane, May 26-June 8, 3 cases, 1 death; Ipswich, May 23, 1 case, 1 death; Sydney, May 25-June 1, 1 death.
China: Amoy, June 22-29, 1 case, 1 death.
India: Calcutta, June 22-29, 28 deaths.
Peru: Callao, June 27, 2 cases, 1 death; Chiclayo, June 27, 6 cases, 3 deaths; Mollendo, June 27, 4 cases; Paita, June 27, 3 cases, 2 deaths; Trujillo, June 27, 22 cases, 5 deaths.
Russia: Odessa, July 14, 1 case, 1 death.

Marriages

WILLIAM RIGHTMAN, M.D., to Miss Toba Fagin, both of Chicago, August 6.

HENRY HARRISON, M.D., to Miss Frances L. Tripp, both of Detroit, Mich., August 6.

GEORGE ALBERT GARDNER, M.D., to Miss Charlotte Thayer, both of Chicago, August 14.

ROSCO C. WATERBURY, M.D., Kinderhook, N. Y., to Miss Ada Wild, of Albany, N. Y., August 6.

ARTHUR H. COOPER, M.D., Superior, Wyo., to Miss Nettie Ansell of Washakie, Wyo., recently.

ROY BISHOP CANFIELD, M.D., Ann Arbor, Mich., to Miss Lelia M. Harlow of Boulder, Colo., August 6.

JOHN J. MOREN, M.D., Louisville, Ky., to Mrs. Ferda Zorn Norton of Vineyard Haven, Mass., recently.

HENRY PAINE STEVENS, M.D., Cambridge, Mass., to Miss Emma Frye of Lewiston, Maine, August 7.

JAMES OWEN CALLAHAN, M.D., to Miss Stella May Hardin, both of Muskogee, I. T., at Arcadia, La., August 6.

Deaths

Henry E. Cushing, M.D. Chicago Medical College, 1884; a member of the American Medical Association; a practitioner of Champaign County, Ill., for 23 years; division surgeon to the Illinois Central Railroad; a man universally esteemed and respected; a practitioner standing for high ideals, uncompromising and unswerving in his attitude toward quackery and irregularities in practice, died at his home in Champaign, Ill., August 11, from pleuro-pneumonia, after an illness of five days, aged 52. At a special meeting of the Champaign County Medical Society, held August 11, resolutions of sorrow and sympathy were unanimously adopted.

Donald Macrae, M.D., L.R.C.P., Edinburgh, 1861; a member of the American Medical Association; once president of the Iowa State Medical Society; president of the Council Bluffs (Iowa) Medical Society; vice-president of the surgical section of the Eleventh International Medical Congress; formerly president of the Missouri Valley Medical Society; professor of railway and clinical surgery in the University of Nebraska College of Medicine, Omaha; a member of the staff of the Council Bluffs General Hospital, and one of the leading surgeons of Iowa, died at his home in Council Bluffs, August 14.

Sorden McClure, M.D. University of Pennsylvania, Department of Medicine, Philadelphia, 1899; a member of the Medical Society of the State of Pennsylvania and Philadelphia County Medical Society; assistant surgeon of the First Infantry, N. G. Pa.; a member of the staff of the Presbyterian and Wills Eye Hospitals, Philadelphia; a specialist in diseases of the eye, ear, nose and throat; died from diphtheria in the Municipal Hospital, Philadelphia, August 7, after an illness of four days, aged 29.

David Riley Corbin, M.D. Vanderbilt University, Medical Department, Nashville, Tenn., 1899; a member of the American Medical Association; formerly president of the Stoddard County (Mo.) Medical Society; a member of the Southeast Missouri Medical Association; councilor for the Twenty-third district of the Missouri State Medical Association; a physician of Stoddard County, died at his home in Bloomfield, Mo., August 10, aged 32.

Ellis P. Townsend, M.D. Jefferson Medical College, Philadelphia, 1863; formerly a practitioner of Beverley and Camden, N. J., and at one time editor of a medical journal; for 18 years a practitioner of Billings, Mont.; died at his home in that city, July 30, from the effects of amputation of the feet, due to exposure last winter, while answering a call near Lame Deer, Mont., where he was employed as government physician, aged 72.

Joseph Graham, M.D. Jefferson Medical College, Philadelphia, 1859; a member of the Medical Society of the State of North Carolina and the Mecklenburg County Medical Society; a Confederate veteran; one of the oldest and most eminent practitioners of Charlotte, N. C.; died at the home of his son in that city, from malignant disease, after an illness of several months, aged 70.

Philip Hurt Strauss, M.D. Bellevue Hospital Medical College, New York City, 1885; of Toledo, Ohio; for one term state health officer of Florida, where he served during the epidemic of yellow fever in 1888; some-time vice-president of the Lucas County (Ohio) Medical Society; died at the Toledo Hospital, August 9, 10 days after an operation for gastric ulcer, aged 46.

Alexander C. MacLean, M.D. University of Michigan, Department of Medicine and Surgery, Ann Arbor, 1877; a member of the Utah State Medical Association and Salt Lake County Medical Society; one of the most prominent practitioners of Salt Lake City, died in a sanitarium in Salt Lake City, after a prolonged illness, August 3, aged 52.

Barnabas W. Day, M.D. Faculty of Medicine of Queen's University and Royal College of Physicians and Surgeons, Kingston, Ont., 1862; for many years a practitioner of Los Angeles and of late years a dentist in that city; died suddenly from cerebral hemorrhage at the Santa Fé Railway station, Los Angeles, August 3, aged 74.

Jesse O. Walker, M.D. Vanderbilt University, Medical Department, Nashville, Tenn., 1888; a member of the Medical Society of the State of North Carolina and Cabarrus County Medical Society; of Concord, N. C., died at the home of his father, in Asheboro, N. C., from neurasthenia, after an illness of three days, aged 40.

Henry Sanford Hickman (Examination, Okla.) 1893; for more than half a century a practitioner of medicine; assistant surgeon of the Second Illinois Volunteer Cavalry during the Civil War; thereafter a practitioner of Newman, Ill., until 1893, when he moved to Oklahoma; died at his home in Lacey, July 18, aged 72.

Matthew A. Graff, M.D. Western Pennsylvania Medical College, Pittsburg, 1901; of Sewickley, Pa.; a member of the American Medical Association, who was attacked by appendicitis August 1, and was removed to Mercy Hospital, Pittsburg, for operation; died in that institution, August 15, from heart disease, aged 31.

William H. Link, M.D. Medical College of Ohio, Medical Department, University of Cincinnati, 1884; a member of the Indiana State and Marion County medical societies; clinical professor of obstetrics in the State College of Physicians and Surgeons, Indianapolis; died at his home in that city, August 10, aged 56.

Lucien Banks, M.D. University of Pennsylvania, Department of Medicine, Philadelphia, 1867; formerly a member of the legislature from Juniata County; a prominent citizen and practitioner of Mifflintown, died at the home of his nephew in that city, August 3, from disease of the stomach, aged 66.

A. Austin Tayman, M.D. University of Pennsylvania, Department of Medicine, Philadelphia, 1865; a practitioner of Lebanon, Mo., for more than a quarter of a century, and surgeon in the Army during the Civil War, died in the Frisco Hospital, Springfield, Mo., August 5, aged 70.

Joseph W. Brooks, M.D. University of Pennsylvania, Department of Medicine, Philadelphia, 1884; for several years inspector of the health bureau, and a member of the staff of the coroner of Philadelphia County; died from uremia at his home in Philadelphia, August 5, aged 51.

Charles Laight, M.D. College of Physicians and Surgeons in the City of New York, 1868; an ophthalmologist of Keene Valley, N. Y., who for the last few years had spent his summers in the Adirondack Mountains and his winters in Rome, Italy, died in that city, April 1, aged 61.

William M. Cole, M.D. University Medical College of Kansas City, Mo., 1903; a member of the Missouri State Medical Association and Pettis County Medical Society; a city physician of Sedalia, Mo., died at his home, from tuberculosis, August 9, after a lingering illness, aged 30.

James Brien, M.D. Faculty of Medicine of Queen's University and Royal College of Physicians and Surgeons, Kingston, Ont., 1872; twice mayor of Essex, Ont., and a member of parliament from South Essex in 1887; died at his home in Essex, August 10, after a long illness.

Elam S. Ramsey, M.D. University of Louisville (Ky.) Medical Department, 1870; for more than 20 years a practitioner of Kansas City, Kan., and surgeon for the Metropolitan Street Railway Company, died suddenly at his home in Kansas City, from heart disease, August 10, aged 60.

James D. Davis, M.D. Jefferson Medical College, Philadelphia, 1880; a member of the Kentucky State and Mason County medical societies; of Maysville, Ky.; died suddenly, August 11, in an automobile, while en route from Maysville to Blue Lick Springs, aged 45.

Elijah D. Buckner, M.D. Hahnemann Medical College and Hospital, Chicago, 1885; president of the National Society for the Prevention of Cruelty to Animals; died at his home in Osceola, Neb., August 6, from disease of the stomach, of long standing, aged 64.

Calvin Hostetler, M.D. Sioux City (Iowa) College of Medicine, 1898; a member of the American Medical Association, and a prominent physician of Marcus, Iowa, died at his home in that city, August 4, after an invalidism of several months, aged 39.

John K. Pemberton, M.D. Medical Department of Washington University, St. Louis, 1867; for 36 years a practitioner in Calloway County, Mo.; died at the home of his son, in Kreba, I. T., after an illness of several months, August 2, aged 62.

Joseph S. Deziel, M.D. Laval University, Medical Department, Quebec, 1893; a member of the American Medical Association and a prominent practitioner of Barre, Vt., died at his home in that city, July 31, from angina pectoris, aged 41.

George W. Gilfillan (Years of Practice, Iowa) 1886; for many years a practitioner of Milton, Iowa, died at his home in Mount Pleasant, Iowa, August 2, after a prolonged illness, from arteriosclerosis, aged 72.

Louis William Exum, M.D. Leonard College of Medicine, Medical Department Shaw University, Raleigh, N. C., 1893; died at Bluefield, W. Va., recently, from typhoid fever, after a short illness, aged 44.

George Lacke, M.D. University of Berlin, Germany, 1848; for 50 years a practitioner of Warrick County, Ind., died at his home in Newburgh, August 4, from cerebral hemorrhage, aged 82.

John William Bryant, M.D. University Medical College of Kansas City, Mo., 1886; of Shamrock, Mo.; died July 27, at the home of his sister, in Webb City, Mo., from typhoid fever, aged 52.

Jesse Patton, M.D. Northwestern University Woman's Medical College, Chicago, 1898; of Aberdeen, S. D.; formerly a practitioner of Georgetown, Colo.; died in Aberdeen, August 9, aged 38.

W. T. Machesney, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1874; formerly of Salina, Iowa, died at his home in Bagley, Iowa, August 5, from heart disease, aged 56.

Eben A. Wood, M.D. Albany (N. Y.) Medical College, 1875; of Syracuse, N. Y.; died at the Hospital of the Good Shepherd in that city, August 12, after an illness of six weeks, aged 54.

John M. Hunter, M.D. Kentucky School of Medicine, Louisville, 1884; of Rockhill, S. C., died at Johns Hopkins Hospital, Baltimore, June 9, after an illness of seven weeks, aged 67.

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Otto Paul Mueller, M.D. Barnes Medical College, St. Louis, 1904; of Pima, Ariz., died at Cluffs' Ranch, Ariz., from tuberculosis, July 27, after an illness of several years, aged 28.

Omer H. Allard, M.D. University of the Victoria College, Coburg, Ont., 1883; a practitioner of Burlington, Vt., died at the Fanny Allen Hospital, April 15, after a short illness.

Freeman Thompson, M.D. Cleveland Medical College, Medical Department Western Reserve College, 1859; died from paralysis at his home in Baldwin, Kan., recently, aged 81.

William Claxton, M.D. Faculty of Medicine of Queen's University and Royal College of Physicians and Surgeons, Kingston, Ont., 1874; of Verona, Ont., died May 29.

James F. Runyan, M.D. Physio-Medical Institute, Cincinnati, 1867; died at his home in Alexandria, Ind., August 9, after an illness of a year and a half, aged 67.

Wayman Hartford Graham, M.D. Hospital College of Medicine, Louisville, Ky., 1895; of Campti, La., died from tuberculosis, at Shreveport, La., July 24, aged 32.

James Wayne McGaughey, M.D. Hospital College of Medicine, Louisville, 1898; of Luther, Okla., died at Guthrie, Okla., August 4, from kidney disease, aged 33.

Daniel McIntosh Johnson, M.D. Halifax (N. S.) Medical College, 1878; died at his home in Tatamagouche, N. S., March 12, after a short illness, aged 40.

Alexander Daniel McGillvary, M.D. Bellevue Hospital Medical College, New York City, 1863; died at his home in Sidney, N. S., May 30, aged 65.

Edwin Brumfield (Years of Practice, Mich.), 1900; a veteran of the Civil War, died at his home in Jackson, Mich., August 4, aged 71.

Medical Education and State Boards of Registration

COMING EXAMINATIONS.

MASSACHUSETTS Board of Registration in Medicine, State House, Boston, September 10-12. Secretary, Dr. Edwin B. Harvey, 159 State House, Boston.

IOWA State Board of Medical Examiners, Capitol Building, Des Moines, September 17-19. Secretary, Dr. Louis A. Thomas, Des Moines.

Reciprocity in North Carolina.—At a meeting of the North Carolina State Board of Medical Examiners, held June 11, 1907, the following rules were adopted in regard to reciprocity which was provided for by an amendment to the practice act passed at the last session of the legislature: 1. The applicant must have a diploma from a medical college requiring a three years' course of study for such degree. 2. He must have a license from a state board of examiners requiring the same per cent. as this state, which is 80. 3. He must present a sworn affidavit from two practicing physicians as to his professional standing in his community. 4. The burden of proof shall rest on the applicant. 5. He shall attend the meeting of the board at the time of application and make application in person. 6. He shall pay a fee of $10 for his license.

McGill Has a Five-Year Course.—As we have previously noted, McGill University Medical Faculty will require hereafter that five years' work must be taken before graduation from that institution. According to the *Montreal Medical Journal*, April, 1907, the fifth year is to be devoted entirely to hospital work. This hospital work will give the student the opportunity to apply the knowledge already received and gradually to assume the responsibility of depending on his own knowledge and observations which he would otherwise be compelled to assume abruptly. The hospital experience will enable the graduates to enter on their lifework with greater confidence than heretofore. This advance will doubtless cause a falling off in the number of students for a time, but the increased excellence of the training should cause a return to the usual number. This important advancement in medical standards has already been advocated by the American Medical Association in the "Ideal Standard" adopted in Portland in 1905.

Iowa March Report.—Dr. Louis A. Thomas, secretary of the Iowa State Board of Medical Examiners, reports the written examination held at Des Moines, March 19-21, 1907. The number of subjects examined in was 8; total number of questions asked, 100; percentage required to pass, 75. Two candidates were examined, one of whom passed and the other failed. The candidate who passed, a graduate of Creighton Medical College, 1903, received a grade of 81 per cent., and the candidate who failed, a graduate of the University Medical College, Kansas City, 1902, received a grade of 70 per cent.

Iowa April and July Reciprocity Reports.—Dr. Louis A. Thomas, secretary of the Iowa State Board of Medical Examiners, sends us the following reports of reciprocal licenses issued at the meetings held by that board April 11 and July 18, 1907:

APRIL REPORT.

College.	Year Grad.	Reciprocity with.
Rush Med. College	(1903), (1905)	(1906) Illinois
American Medical Miss. Coll.		(1903) Illinois
N.-W. Univ. Med. School (1903) Kansas;		(1905) (1906) Illinois
Baltimore Medical College		(1903) Illinois
University Med. Coll., Kansas City		(1897) Missouri
Barnes Medical College		(1906) Illinois

JULY REPORT.

Rush Medical College	(1902)	(1906) Illinois
College of P. and S., Chicago, (1904)	(1905)	(2, 1906) Illinois
Dearborn Medical College		(1906) Illinois
Northwestern Univ. Med. School		(1906) Illinois
St. Louis Coll. of P. and S.		(1907) Missouri
St. Louis University		(1905) Missouri
Ensworth Central Medical College		(2, 1907) Missouri
Creighton Medical College		(1906) Nebraska
University of Nebraska		(1905) Nebraska

Indiana May Report.—Dr. W. T. Gott, secretary of the Indiana State Board of Medical Registration and Examination, reports the written examination held at Indianapolis, May 28-30, 1907. The number of subjects examined in was 16; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 133, of whom 122 passed, including 5 osteopaths, and 11 failed. Eight reciprocal licenses were issued. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Rush Med. Coll.	(1903) 89.4; (1906) 89.3;	(1907) 93.4
Hahnemann Medical College		(1907) 87.8
American Coll. of M. and S., Chicago (1905) 76.4;		(1906) 86.
Northwestern Univ.	(1903) 87.6; (1904) 90.1;	(1906) 87.1
College of P. and S., Chicago	(1897) 92.8;	(1903) 88.6
Indiana Medical College (1906) 75.2, 82.6; (1907) 75.3, 75.5, 75.8, 78, 78.2, 79.5, 80.3, 80.9, 81.3, 81.6, 82.4, 82.5, 82.6, 82.8, 83.2, 83.4, 84.2, 85, 85.2, 85.5, 85.7, 86, 86.4, 87, 87.1, 87.4, 87.5, 87.6, 87.6, 87.7, 87.7, 87.7, 88.1, 88.1, 88.5, 88.8, 88.8, 88.9, 88.9, 89.1, 89.1, 89.3, 89.3, 89.6, 89.9, 90.1, 90.1, 90.2, 90.3, 90.3, 90.5, 90.5, 90.8, 90.8, 91, 91.1, 91.3, 92, 92.1, 93.2, 93.8, 94.4.		
State Coll. of P. and S., Indianapolis (1907) 83.1, 85.4, 86.2, 86.2, 87, 87.2, 88, 88.3, 88.6, 88.8, 89.8, 89.8, 90, 90.7, 91.8, 92.4, 92.6, 92.9, 93.3, 93.7, 93.9, 94.2, 94.4.		
Physio-Med. Coll. of Indiana (1907) 83.9, 87.6, 87.9, 88.3, 90.5,		90.8
Eclectic Medical College of Indiana		(1905) 87.5
Louisville Medical Coll.	(1894) 87.1;	(1905) 85.6
Kentucky School of Medicine		(1906) 82.
College of P. and S., Baltimore		(1907) 92.2
Harvard Medical School		(1901) 87.
St. Louis University		(1906) 89.6
Kansas City Hahnemann Med. Coll.		(1906) 88.2
Miami Medical College		(1902) 88.4
Eclectic Medical Institute, Cincinnati		(1907) 83.5, 89.9
Medico-Chirurgical College, Philadelphia		(1895) 81.6

FAILED.

Illinois Medical College		(1906) 63.7
Rush Medical College		(1894) 62.1
Indiana Medical Coll.	(1906) 51.4, 65.4;	(1907) 69, 69.9
Eclectic Med. Coll. of Indiana	(1906) 62.3;	(1907) 71.5
Medical College of Indiana		(1904) 57.4
Hospital College of Medicine, Louisville		(1906) 67.1
Eclectic Med. Institute, Cincinnati		(1906) 62.8

LICENSED THROUGH RECIPROCITY.

College.	Year Grad.	Reciprocity with.
Columbia University, Washington, D. C.	(1898)	Dist. Colum.
University of Iowa	(1897)	Iowa
Harvard Medical School	(1897)	Vermont
University of Michigan	(1903)	Missouri
Medical College of Ohio	(1899)	Ohio
Eclectic Med. Institute, Cincinnati	(1905)	Ohio
Jefferson Medical College	(1878)	Michigan
Meharry Medical College	(1894)	Kentucky

Mississippi May Report.—Dr. J. F. Hunter, secretary of the Mississippi State Board of Health, reports the written examination held at Jackson, May 14-15, 1907. The number of subjects examined in was 8; total number of questions asked, 64; percentage required to pass, 75. The total number of candidates examined was 235, of whom 71 passed, including 43 non-graduates, and 164 failed, including 90 non-graduates. The following colleges were represented:

PASSED. College.	Year Grad.	Total Num. Ex.
Atlanta College of P. and S.	(1907)	1
Louisville Medical College	(1905)	1
Tulane University of Louisiana	(1, 1906); (4, 1907)	5
Saginaw Valley Medical College	(1902)	1
Mississippi Medical College	(1907)	6
Barnes Medical College	(1, 1903); (1, 1907)	2
Memphis Hosp. Med. Coll. (1, 1899), (1, 1906), (5, 1907)		7
University of Nashville	(1, 1906), (2, 1907)	3
College of P. and S., Memphis	(1907)	2

FAILED.

Medical College of Alabama	(1907)	2
Atlanta College of P. and S.	(1905)	1
Louisville Medical College	(1906)	1
Hospital College of Medicine, Louisville	(1906)	2
Kentucky University	(1904)	1
Harvey Medical College	(1905)	1
Tulane University of Louisiana	(1, 1904); (3, 1907)	4
Flint Med. Coll. (1, 1903); (1, 1904); (1, 1905); (4, 1907)		7
Baltimore University	(1904)	1
University of Mississippi	(1904)	1
Mississippi Medical College	(1907)	11
St. Louis College of P. and S.	(1896)	1
Washington University, St. Louis	(1904)	1
Leonard Medical School	(1907)	1
Memphis Hospital Medical College	(2, 1903); (2, 1905); (1, 1906); (13, 1907)	18
University of Nashville	(1, 1902); (1, 1906); (4, 1907)	6
University of Tennessee	(1901)	1
College of P. and S., Memphis	(1907)	2
University of the South	(1906)	1
Knoxville Medical College	(1906)	1
Chattanooga Medical College	(1905)	1
Meharry Medical College	(1, 1903); (3, 1906); (4, 1907)	8
Gate City Medical College	(1906)	1

Connecticut Homeopathic July Report.—Dr. E. C. M. Hall, secretary of the Homeopathic Examining Board of Connecticut, reports the written examination held at New Haven, July 9, 1907. The number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 2, both of whom passed. The following colleges were represented:

PASSED. College.	Year. Grad.	Per Cent.
Boston University	(1907)	89.
New York Homeo. Medical College	(1906)	89.

Connecticut July Report.—Dr. Charles A. Tuttle, secretary of the Connecticut Medical Examining Board, reports the written examination held at New Haven, July 9-10, 1907. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 34, of whom 29 passed and 5 failed. The following colleges were represented:

PASSED. College.	Year. Grad.	Per Cent.
Yale Med. School (1904) 88.4; (1905) 84.7; (1906) 82.5; (1907) 77.1, 79.4, 79.5, 79.7, 81.9, 81.9, 81.9, 82.4, 83.4, 83.9, 86, 86.9, 89.		
College of P. and S., Baltimore	(1907)	82.
Maryland Medical College	(1906) 81.4; (1907)	77.3
University of Maryland	(1907)	82.1
Harvard Medical School	(1905)	79.9
Tufts College Medical School	(1905)	77.2
Coll. of P. & S., N. Y.	(1893) 78.2; (1895) 80.9; (1905)	78.1
Long Island Coll. Hospital	(1907)	79.7
Jefferson Medical College	(1905) 83.1; (1906)	77.
University and Bellevue Hosp. Med. Coll.	(1907)	82.8

FAILED.

University of Maryland	(1907)	73.2
Baltimore Medical College	(1907)	73.1
Maryland Medical College	(1907)	61.8
College of P. and S., Boston	(1906)	54.2
University of Messina, Italy	(1905)	20.3

Missouri July Report.—Dr. J. A. B. Adcock, secretary of the Missouri State Board of Health, reports the written examination held at Mexico, July 9-11, 1907. The number of subjects examined in was 12; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 21, of whom 9 passed and 12 failed. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Northwestern Univ. Med. School	(1904)	82
Rush Medical College	(1906)	80
University of Louisville	(1907)	78
University Med. Coll., Kansas City	(1907)	76
Washington University, St. Louis	(1907)	75
Barnes Medical College	(1907)	75
St. Louis University	(1906) 77; (1907)	82
University College of Med., Richmond	(1895)	75

FAILED.

American Coll. of Med. and Surg., Chicago	(1907)	72
St. Louis Coll. of P. and S.	(1906) 60; (1907) 66, 66,	73
American Med. Coll., St. Louis	(1907)	71, 72
Washington University, St. Louis	(1907)	70
University Med. Coll., Kansas City	(1907)	70, 72
Barnes Medical College	(1907)	60, 72

Colorado July Report.—Dr. S. D. Van Meter, secretary of the Colorado State Board of Medical Examiners, reports the written and oral examination held at Denver, July 2, 1907. The number of subjects examined in was 8; total number of questions asked, 80; per centage required to pass, 70. Eighty-seven candidates were licensed at this examination, 32 of whom passed the examination and 46 were registered on presentation of satisfactory credentials. Final action regarding those who failed will not be taken until the October meeting of the board. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Denver and Gross Coll. of Medicine (1907) 71.5, 72.1, 77.4, 78, 79, 79.3, 79.6, 82.5, 82.8, 83.1.		
Colorado School of Medicine (1907) 72.8, 73.6, 75.8, 76, 77.2, 77.8, 78, 78.3, 78.5, 78.7, 80.1, 84.1.		
Denver Homeo. Med. College	(1907) 73.7, 76.3, 76.3, 77.5,	78.1
Rush Medical College	(1907)	74.2
Northwestern Univ. Med. School	(1907) 78.1,	81.1
Indiana Medical College	(1907)	77.7
St. Louis University	(1907)	77.

REGISTERED ON CREDENTIALS.

Columbian University, Washington	(1900)
Birmingham Medical College	(1898)
College of P. and S., Chicago	(1902)
Northwestern University	(1886), (1893), (1894), (1900)
Rush Medical College	(1896), (1901), (1907)
Dunham Medical College	(1902)
Illinois Medical College	(1897)
Hahnemann Medical College, Chicago	(1888), (1890)
American Med. Miss. Coll.	(1900)
Medical College of Indiana	(1894)
Keokuk Medical College	(1891)
University of Iowa	(1894), (1905)
University of Louisville	(1887)
Kentucky School of Medicine	(1892)
University of Maryland	(1902)
Maryland Medical College	(1904)
Baltimore University	(1898)
Boston University	(1895)
University of Michigan	(1878)
Missouri Medical College	(1886)
St. Louis University	(1906)
Barnes Medical College	(1902)
St. Louis College of P. and S.	(1903)
Central Medical College	(1898)
Ensworth Medical College	(1904)
Washington University, St. Louis	(1906)
Medical College of Ohio	(1880), (1887)
Cleveland Homeopathic Med. Coll.	(1884), (1893)
American Eclectic Med. Coll., Cincinnati*	(1887)
Miami Medical College	(1906)
Ohio Medical University	(1904)
Jefferson Medical College	(1871), (1905)
University of Pennsylvania	(1899)
Hahnemann Medical Coll., Philadelphia	(1886)
Vanderbilt University	(1893)
University of Tennessee	(1891)

*This college became extinct in 1896.

Society Proceedings

COMING MEETINGS.

Ohio State Medical Association, Cedar Point, August 28.
Medical Society of the Missouri Valley, Council Bluffs, Iowa, Sept. 5.
Washington State Medical Association, Seattle, September 10-12.
Colorado State Medical Society, Glenwood Springs, Sept. 17-19.
Amer. Assn. of Obstetricians and Gynecologists, Detroit, Sept. 17-19.
American Electro-Therapeutic Assn., Boston, Sept. 17-19.
Medical Society of the State of Pennsylvania, Reading, Sept. 23-26.
Southern Medical Association, Birmingham, Ala., Sept. 24-26.
Amer. Acad. of Ophthal. and Oto-Laryng., Louisville, Sept. 26-28.
American Public Health Assn., Atlantic City, Sept. 30-Oct. 4.
Medical Assn. of District of Columbia, Washington, Oct. 1.
American Roentgen Ray Society, Cincinnati, Oct. 2-4.
Idaho State Medical Society, Boise, Oct. 3-4.
State Medical Society, Wilmington, Oct. 8.
Nevada State Medical Society, Reno, Oct. 8-9.
Mississippi Valley Medical Association, Columbus, O., Oct. 8-10.
Vermont State Medical Society, St. Johnsbury, Oct. 10-11.

OREGON STATE MEDICAL ASSOCIATION.

Thirty-third Annual Session, held at Seaside, July 12-13, 1907.

The President, Dr. E. B. Pickel, Medford, in the Chair.

Officers Elected.

The following officers were elected to serve during the ensuing year: President, Dr. R. C. Coffey, Portland; vice-presidents, Dr. N. Moliter, LaGrande; Dr. M. Rosenburg, Prineville; Dr. A. C. Seeley, Roseburg; secretary, Dr. William House, Portland; treasurer, Dr. Edna Timms, Portland; councilors, Dr. C. J. Smith, Pendleton, and Dr. E. J. Labbe, Portland; delegate to the American Medical Association, Dr. Andrew C. Smith, Portland; alternate, Dr. W. T. Williamson, Portland.

Secretary L. H. Hamilton reported that the association is composed of nine component societies, with a membership of 356.

Chronic Amebic Dysentery, a Surgical Disease.

Dr. John Milton Holt, U. S. P. H. and M.-H. S., Astoria, said that after the dysentery had continued one year, with

lesions above the sigmoid, and resistent to colonic irrigations, and the patient in as good a condition as would be required for appendectomy, the condition is a surgical disease. Water is the principal source of infection, but Chinese use human excreta over vegetables in the gardens. The Pacific Coast receives the majority of those returning from the Philippines, and there is no law prohibiting the dangerous practices of the Orientals. He operates by the R. F. Weir method, and flushes the colon with medicated solutions.

DR. K. A. J. MACKENZIE, Portland, believed Dr. Holt too conservative in waiting a whole year before operating, and stated that in view of the dangers of perforation, six months should be set as the period of operation.

DR. A. E. ROCKEY, Portland, has improved on the Weir method, by sewing the cecum to the abdominal peritoneum and wrapping the appendix around a gauze roll, then waiting for a few weeks for the appendix to slough, and form a line of demarcation near the stump. Then he cuts the dead tissue away, leaving a small stump of appendix, with a well secured opening.

Stokes-Adams Disease; Heart Block.

DR. WILLIAM HOUSE, Portland, considered arteriosclerosis from syphilis or alcoholism or injury to the upper part of the cord, as the immediate causative factor. He reported a case of syncopal seizures, eight or ten a day, with a pulse of 28, pupillary inequality and exaggerated left patellar reflex, which he diagnosed as being caused by basilar aneurism.

DR. R. L. GILLESPIE, Portland, saw this case and diagnosed it as one of brain pressure, but had not located it.

Opsonic Index in Tuberculosis.

DR. W. R. M. KELLOGG, Seattle, recorded observations with charts in 23 cases of localized tuberculosis. Index determined 205 times at intervals of ten days, and when indicated, a vaccination of 1/3000 to 1/8000 mg. tuberculin, T.R., was given. In 178 cases parallel counts of the phagocytic index were compared with the opsonic index. There was an average difference of .025 between them. He reported several cases where marked improvement had taken place, but caseous glands, he said, will persist.

DR. E. J. LABBE, Portland, reported a case of healed pulmonary lesions, in which there developed ulceration of the intestines. Improvement was noted after three vaccinations of T.R.

DR. J. A. FULTON, Astoria, said that for twenty-five years before the word opsonin was known, Dr. August Kinney of Astoria had been studying the treatment of tuberculosis with serum. He had learned to reduce the strength of the serum and lengthen the intervals.

Diphtheria Antitoxin in Hay Fever and Asthma.

DR. J. A. REUTER, The Dalles, has used antitoxin in 60 cases of these diseases in repeated doses of 2,000 to 3,000 units. Forty-one patients were cured. Fifteen cases were caused by diseases of the heart, kidneys or liver, or were due to tuberculosis. These patients were not benefited, and four more were only temporarily relieved.

DR. C. J. SMITH, Pendleton, used the antitoxin in several cases, and believed that 60 per cent. of asthmatics can be benefited, failures being due to badly selected cases, where emphysema has occurred, or destructive inroads have been made in the lung tissue.

DR. R. L. GILLESPIE, Portland, had used the treatment in two cases, with good results.

DR. E. A. PIERCE, Portland, applied it in 12 cases, and almost uniformly met more or less success. He thought most relief was gained in neurotic cases with anemia.

DR. K. A. J. MACKENZIE, Portland, believed the serum has a soothing effect on the mucous membrane of the bronchial tubes, and that in diphtheria the curative action is not spent alone on the blood, but that the mucous membrane of the throat receives a localized influence.

Surgical Treatment of Goiter.

DR. ANDREW C. SMITH, Portland, thought that this field of surgery is shunned, yet it is one which gives eminent satisfaction. He has done 17 thyroidectomies, and all but four were done under local anesthesia, preceding it with a hypodermic injection of morphin and atropin, and marking the line of incision with carbolic acid, tracing again with alcohol. He is careful to throw the anesthetic completely across the line of incision. This prevents the engorgement caused by general anesthesia, avoids asphyxia, and permits the patient to phonate at the request of the operator.

Abdominal Diagnosis as Tested by Operation.

DR. J. N. HALL, Denver, insisted that an abdominal case not doing well, or not too far advanced, should be subjected to an exploratory operation. He reported 312 cases, in which the diagnosis was substantially correct in 244. Several cases showed mistaken diagnosis, yet operation was necessary.

DR. R. C. COFFEY, Portland, said that internist and surgeon should work together in such cases, and thus reduce the danger to the minimum.

DR. A. C. SMITH said that it is often impossible to make a pathologic diagnosis before incision, and we must go in prepared to do whatever presents. These are surgical cases and they must be given surgical treatment.

Far Advanced Cases of Cancer of Large Bowel.

DR. R. C. COFFEY, Portland, in 14 months treated 13 cases, only six of which were seen early enough to render radical operation justifiable. He did mostly enteroanastomosis. Far advanced obstructive cancer, not extensive, should be removed. Extensive growths producing obstruction should be excised, in selected cases; others may be relieved by entero- or colocolostomy. Extensive growths with no obstruction but cachexia demand such operations as will add to the comfort of the patient.

Sanatorium Treatment of Tuberculosis in the Northwest.

DR. E. A. PIERCE, Portland, said that of 90 cases treated for an average of 70 days, 9 were apparently cured, 33 improved and 26 unimproved. Humidity of the atmosphere keeps the air practically dust-free, and more improvement is made during the coldest, rainiest weather than in the hot months. The cloudy skies are restful, and this climate is as well adapted as any other to recovery.

DR. J. N. HALL, Denver, remarked on the freedom from dust on the railroads of western Oregon.

DR. KELLOGG, Seattle, thought the Oregon climate restful to a weak heart, relieving tension of the nerves.

DR. KUYKENDALL, Roseburg, thought the time not yet ripe to draw conclusions as to the percentage of recoveries.

Epidemic Cerebrospinal Meningitis in Oregon.

DR. C. H. WHEELER, Portland, gave the number of deaths as 61 during May and June, 1907, the disease being most virulent in May, when 35 died. The youngest victim was 3 years of age and the oldest 65. Temperature was subnormal, or elevated 1 to 1½ degree; pulse slow until death was near, then increasing as high as 106. Neither rigidity of the neck nor Kernig's sign were always present. Hemorrhagic spots were small and indicated gravity. He believes the germ is disseminated through the atmosphere, and that overcrowding and breathing vitiated air conduces to the acquirement of the disease. Cold, dry and cloudy days are favorable to its spread, while bright sunlight, or alternate rain and sunlight, arrest its course.

Resolutions.

DR. F. W. VANDYKE, Grant's Pass, presented correspondence held with the New York Mutual Life Insurance Company, whose agents assured Dr. Vandyke that satisfactory men were easily secured in Portland as insurance examiners. He asked for an expression of the regard with which the reduction of fee to $3 was held by the society. He said that no doctor in his county would make an examination for less than $5. He was informed that last year the society passed a resolution to make no examinations for less than $5, but that some were doing it, and had not been reminded by the society. Dr. Vandyke moved that the society reaffirm its action of last year and instruct the board of councilors to enforce the resolution. This motion was carried.

DR. K. A. J. MACKENZIE introduced a resolution asking the

appointment of a committee to investigate the Chinese vegetable gardens, and report on the use of human excreta for enriching, as described in Dr. Holt's paper. The resolution was adopted.

The Examination of a Patient, with the View of Giving Medical Opinion.

Dr. George F. Wilson, Portland, reported several cases of hysteric paralysis and contractures, and of malingering where damages were brought against companies, and were granted by the court. Begin examination at the top of the head, and proceed downward, interrogating the position and character of each organ, and how it is functionating, looking out for anomalies of the anatomy.

Dr. Willis, Seattle, said the points of the paper might be summed up as an avoidance of prejudice, and thoroughness of examination, and the habit doctors have of disagreeing does much to bring the profession into disrepute.

Dr. A. W. Moore, Portland, said the popular idea is that the company's physician must be prejudiced. The insurance companies have figured out and hold an estimate of how much loss they will meet each year through these dishonest doctors, the family physician and the company doctor. There should, by all means, be a commission on examination appointed by the court.

Dr. W. T. Williamson said a doctor may be honest but ignorant. One must know the tests and take time to use them. A doctor who has not taken time to examine his patient thoroughly is not fit to go on the stand. A broad-minded physician will try to be fair and unbiased and give testimony only as a scientific physician.

Mountain or Spotted Fever in Idaho and Eastern Oregon.

Dr. William O. Spencer, Huntington, described the disease as being very fatal in the Bitter Root Valley of Montana, and appearing with a lesser mortality in the northwestern states, being limited to certain localities, occurring in the spring and summer months. The cause is the bite of the wood tick, which introduces parasites into the blood, which are described as ovoid intracorpuscular bodies showing ameboid movements.

Ulcer of Stomach.

Dr. R. A. J. Mackenzie, Portland, reported 40 cases of hematemesis from ulcer of the duodenum or stomach without a death. The best treatment is lavage with water at a temperature of 120 to 130 F.

Medical Education.

The committee on medical education reported efforts made along the lines laid down by the American Medical Association, and recommended that lectures be delivered in schools, conventions and other places, and articles be written for the public press by physicians, as advised by the American Medical Association. The report was adopted.

Reciprocity.

Dr. R. L. Gillespie, Portland, presented a resolution asking that a committee be appointed to confer with the state boards of the states adjoining Oregon, with a view to establishing laws of reciprocity. The resolution was referred to the committee on public policy and legislation.

Transactions.

The House of Delegates voted to publish the transactions of the association in book form, for the benefit of absent members, who pay yearly dues yet are prevented from attending the conventions.

OREGON STATE HEALTH ASSOCIATION.

Second Annual Meeting, held at Seaside, July 12, 1907

Officers Elected.

Officers elected were: President, Dr. E. P. Geary, Portland; vice-president, Dr. Esther C. Pohl, Portland; secretary-treasurer, Dr. Fred Ziegler, Portland.

Dr. E. P. Geary read a paper on "Some Problems in Public Health."

Dr. J. M. Holt, Astorin, said these questions are of interest to the marine service as well as to the Army. He considered the Texas quarantine against tuberculosis as extreme, and feared it would not sustain the pressure that would be brought to rescind it. The trouble with quarantines is that the law usually allows diseased persons to go out of the state, but allows no one to come in. The U. S. P. H. and M.-H. S. is doing good work examining all immigrants, but the public press is usually pretty bitter when immigrants have to be returned.

Dr. E. A. Pierce, Portland, thought that the hardest work a state board has to do is to get the county health officers and the county judges to work with the board. When this is accomplished we can succeed in getting the doctors in the outlying districts to do better work in sanitation.

Dr. C. H. Wheeler complained that doctors do not always report contagious disease, and considerable infection is kept about in that way. He has attempted school inspection, but with 23,000 children, and no one regularly delegated to the work, it was an impossibility.

Dr. Pierce suggested that the superintendent of public instruction be requested or required to put courses in sanitation in the teachers' institutes.

Medicolegal

Powers Relative to Enforcement of Vaccination Law and Probable Cause for Commencing Prosecution.

The Supreme Court of North Carolina says, in the case of Morgan vs. Stewart, that the statute law of that state provides, in substance (Revisal of 1905, Section 4451), that on the appearance of smallpox in a neighborhood the authorities of any city or town or the sanitary committee of any county may make such regulations and provisions for the vaccination of its inhabitants, and impose such penalties, as they may deem necessary to protect the public health. And Section 3455 provides that, "If any person shall violate any of the rules and regulations of the sanitary authorities of any county in regard to vaccination, he shall be guilty of a misdemeanor, and fined, not exceeding fifty dollars, or imprisoned, not exceeding thirty days."

The court finds no precise form in which the resolutions of a county sanitary board should be couched, nor any specific or stated order of proceedings where such matters are to be considered or determined. It sees no reason why an order of the sanitary committee of a county in which there were a number of cases of smallpox should not be upheld as a valid exercise of the authority conferred on them by the statute, when the order provided that "any person or persons within a radius of three miles of any schoolhouse who willfully refuses to be vaccinated or to allow any one in his charge to be vaccinated shall be guilty of a misdemeanor," and that the county superintendent of health should proceed to enforce compulsory vaccination to such an extent as he might consider necessary. They could not declare the prohibited act a misdemeanor because its status had already been so fixed by public law, but their resolution could still be received and construed as a regulation requiring parties within the prescribed territory to submit to vaccination; and the statute makes the refusal a misdemeanor within the jurisdiction of a justice of the peace. Legislation of this character has been upheld by well-considered decisions in this and other jurisdictions. Hutchins vs. Durham, 137 N. C. 68; State vs. Hay, 126 N. C. 999; Morris vs. Columbus, 102 Ga. 792.

It is also well established that the legislature may confer on local boards, certainly those clothed with governmental functions, the power to make reasonable regulations to protect the public health and to fix and establish facts or conditions on which a statute makes its own action depend. State vs. Railroad, 141 N. C. 852; 8 Cyc. 830; Freund on Police Power, Section 34. And while these local regulations are required to be reasonable, and are, to some extent, subject to judicial control, both as to the existence of an apprehended danger and the reasonableness of the relief (Freund on Po-

fice Power), this court has held (State vs. Hay) that, "where a statute of this kind has been passed and the conditions established which call it into operation, it thus becomes a law binding on each and all alike, and it is optional to no one's private judgment whether to render compliance or not. If there are exceptional cases, where, owing to the peculiar state of the health or system, vaccination would be dangerous, that would be a matter of defense, the burden of which would be on the defendant."

In this case the defendant, as county superintendent of health in the county where such order was passed, having heard that there were several cases of smallpox near the plaintiff's school, one within a half mile, and in sight, called at the schoolhouse, explained the conditions and the law, as he understood it, and requested that he be allowed to vaccinate the plaintiff and his scholars, which request was refused. Having referred the matter to the secretary of the state medical board at Raleigh, and having been advised that the teacher was indictable and should be proceeded against, and, furthermore, having been shown a letter from the attorney general of the state to the superintendent of public instruction, in which the attorney general advised that regulations similar to those of the county in question could be lawfully enforced, the defendant county superintendent of health instituted a prosecution on which the plaintiff in this case was tried and acquitted. Then the plaintiff instituted this action for malicious prosecution, and got judgment. But the Supreme Court reverses that judgment, saying that it seems clear to it that in no aspect of the testimony, as the same was presented, had there been a want of probable cause shown, and the court below should have dismissed the case as on judgment of non-suit. Probable cause, in cases of this kind, has been properly defined as the existence of such facts and circumstances, known to him at the time, as would induce a reasonable man to commence a prosecution.

Peculiar Religious Beliefs and Sanity.

The Supreme Court of Iowa says, in the will case of Henderson vs. Jackson, that the allegation of undue influence on which the contestants relied was simply this, that the testatrix, four years after the death of her husband, felt herself bound by his request and by her promise made him in his lifetime so that she made a will disposing of her property in a different manner than she would have done had the alleged influence not existed. But this fell very far short of the undue influence which in law is held to invalidate a will. Just what was meant by the allegation of her fear that she might "suffer the displeasure of her husband in the future" was not clear, unless it might be interpreted as a belief on her part that she would meet her husband in the world to come, and that her failure to show deference to his wishes here would tend to mar the pleasure of their communion there. But who may assume to say that such an article of faith is the product of a diseased mind, or that a person who acts on it is the subject of undue influence?

If a devout person, being about to prepare his will, makes it the subject of prayer, and believing that he has received divine help in planning the distribution of his estate, proceeds to act accordingly, would any court sustain a verdict which finds in this part alone a ground for invalidating such will? There are many persons whose soundness of mind and business sagacity none can doubt, who believe in the possibility of communication with disembodied spirits, and habitually take counsel from such sources with reference to their conduct in life. Is such a person incapable of making a valid will, and should his will be set aside as the product of an insane delusion, or as having been executed under undue influence, simply because he believes his act to have the approval of the inhabitants of the spirit land? The court thinks not.

Few men live who have not some desire, hope, or belief with reference to a life to come and the continued conscious existence in some form of their departed friends, and such faith has always been and doubtless will always remain a potent factor in the lives and conduct of nearly every member of our race. The particular form of faith which one espouses may seem to another unreasonable, or unphilosophical or even ridiculous, but it is not for the legislature nor for the courts to judge between them, or brand the adherents of any particular belief as lunatics or incompetents.

It is true that if there be other circumstances fairly tending to show unsoundness of mind, or the exercise of undue control of one mind by another, all these peculiarities of life and conduct, religious or otherwise, will properly be a matter of inquiry, and may in some instances furnish legitimate support to a verdict or judgment against the validity of a will. But standing alone, the court thinks no case can be found in which it has been held that such peculiarities of the testator are sufficient to impeach his testamentary capacity or to establish a charge of undue influence. For instance, it is held that a belief in witchcraft or in the visits of ghosts does not invalidate a will. Nor is it sufficient to show that the testator's imagination was generally controlled by his belief in witches, devils and evil spirits which tormented him. Or that the testator was a firm believer in the transmigration of the souls of men after death into inferior animals, and that, influenced by such belief, left his property for a society for the prevention of cruelty to animals. Or that his ordinary conduct was more or less influenced by spiritual beliefs and manifestations. In Brown vs. Ward, 53 Md. 376, the testatrix consulted the spirit of her deceased brother, and in drawing her will agreed in accordance with instructions believed by her to have been so received, and it was held not sufficient to defeat the will so made. Belief in future rewards and punishments is not a test of soundness of mind. The belief by a testatrix that the spirit of her deceased husband is present with her is not an insane delusion which affects the validity of her will.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

Medical Record, New York.

August 10.

1 *Plain Truths About Syphilis. L. D. Bulkley, New York.
2 Differentiation of Black Pigment Found in Liver, Spleen and Kidneys from Foreign Deposits. F. Gaertner, Pittsburg, Pa.
3 Etiology and Treatment of Prostatic Concretions. J. M. Thompson, Boston.
4 *Ophthalmia of the Newborn. J. C. Edgar, New York.
5 *Sterility in the Male. F. R. Hagner and H. G. Fuller, Washington, D. C.

1. Plain Truths About Syphilis.—Bulkley states that syphilis is a much more prevalent disease than is generally supposed, and is not infrequent in good society in the city and country. He emphasizes the facts that it is not necessarily a venereal disease, and that innocently acquired syphilis is of common occurrence. He asserts that in its earlier stag a too much care can not be exercised in order to prevent the infection of others, innocently or otherwise.

4.—This article is almost the same as that which appeared in THE JOURNAL, Aug. 3, 1907, page 411.

5. Sterility in the Male.—For the treatment of this condition Hagner and Fuller employ an operation for closure of the globus minor, by making an anastomosis between the globus major and the vas deferens, which was devised by Martin of Philadelphia.

New York Medical Journal.

August 10.

6 *The Urine in Pregnancy. J. C. Edgar, New York.
7 *Cerebral Localization of Aphasia. C. L. Dana, New York.
8 *Angioneurotic Edema. S. Loving, Columbus, Ohio.
9 *Hysteria. A. Gordon, Philadelphia.
10 Physiology and Pharmacology of the Ureter. D. R. Lucas, New York.
11 *Case of Addison's Disease in Child. D. Felberbaum and E. Fruchthandler, New York.
12 *An Unpleasant Experience with Ethyl Chlorid. J. T. Rugh, Philadelphia.
13 Mercuric Values in Treatment of Syphilis. W. F. Bernart, Chicago.

6. Urine of Pregnancy.—According to Edgar, the normal pregnancy urine must not be persistently small in quantity; the urea output must not be persistently low; it should not contain albumin, casts or excessive quantities of indican. Moreover, the total nitrogen should be presented by proper proportions of the nitrogen compounds. A number of cases

are cited to illustrate the significance of any deviation from the points mentioned, and the treatment required.

7.—Abstracted in THE JOURNAL, May 18, 1907, page 1712.

8. **Angioneurotic Edema.**—Loving reviews the clinical history of this affection, and reports five cases.

9. **Hysteria.**—Gordon discusses the nature of hysteria, its medicolegal relation and the diagnostic significance of its motor, sensory and psychic manifestations.

11. **Addison's Disease.**—The authors report a case of Addison's disease, occurring in a little girl, 12 years of age. There was absence of some of the classical symptoms—the severe gastric disturbances, marked asthenia, and attacks of syncope—but the mode of termination proved the diagnosis of Addison's disease to be correct. A necropsy was not permitted. The authors also present an analytical study of 24 cases that have been reported in the literature. They draw attention to the fact that together with tuberculosis of the adrenals, the mesenteric lymph nodes are often found diseased. They deem this finding of significance in pointing out the source of infection through the intestines. Furthermore, death usually occurs under convulsions, as in their own case.

12. **Ethyl Chlorid Anesthesia.**—Rugh reports an unpleasant experience with ethyl chlorid. For obvious reasons this anesthetic was preferred to others, but the choice almost cost the patient his life. When surgical anesthesia was obtained there were clonic spasms of the legs and arms; respiration ceased, and the muscles of the jaws and neck were set in clonic spasm; cyanosis was marked; the eyes were fixed and staring, but the pupils remained contracted. The most vigorous attempts to restore respiration were successful after there had been an actual suspension of respiration for about three minutes.

Boston Medical and Surgical Journal.

August 8.

14 *Comparative Tests for Occult Blood in Gastric Contents and Feces. J. W. Lewis, Boston.
15 *Fermentation Specific Gravity Method of Estimating Sugar in Diabetic Urine. H. A. Christian, Boston.
16 Treatment of Fever Cases in Public Service. C. A. Drew, State Farm, Mass.
17 *Arteriovenous Anastomosis. J. C. Hubbard, Boston.
18 *Glottic Spasm of Nasal Origin in Adults. F. A. Conlon, Lawrence, Mass.

14. **Tests for Occult Blood.**—Dewis made an extensive research into the comparative value of the various tests employed for the detection of occult blood in the gastric contents and feces. He says that the benzidin test is by far the most delicate and also the most practical; a positive benzidin and a positive guaiac test must be considered as even more trustworthy than a positive benzidin test alone, and guaiac is a safer test than benzidin for stools when meat has not been excluded from the diet.

15. **Estimating Sugar in Diabetic Urine.**—Christian reviews briefly his results in testing diabetic urine for sugar by means of Fehling's method, the polariscopic method, and the fermentation specific gravity method. He thinks the last named is the simplest for the general practitioner because it requires no laboratory, and needs only a bit of yeast from the kitchen, and the urinometer or specific gravity bulb, which every physician has. Furthermore, it is a sufficiently accurate method for making a quantitative estimation of glucose in the urine to enable the practitioner to treat scientifically his cases of diabetes mellitus.

17. **Arteriovenous Anastomosis.**—Hubbard reports two cases, in which an arteriovenous anastomosis was made. For the history of one of these cases, previously published, see THE JOURNAL, Nov. 17, 1906, page 1683. The second case was that of a woman of 60 years, with senile gangrene of the foot and of a portion of the leg. The arteries were atheromatous. The femoral artery was invaginated into the femoral vein in Scarpa's triangle, and the distal end of the artery and the proximal end of the vein were ligated. There was no shock and no change in the appearance of the leg. The vein pulsated after the controlling clamps were removed. Ten days later it was necessary to amputate above the knee for the gangrene, which had been present before the operation. The anastomosis was cut down on and removed. The artery was found filled with a loose, easily detached clot. This case was, therefore, a distinct failure. Hubbard suggests that clot formation may be prevented by smearing vaselin or some other substance onto the cut end of the invaginated artery, or to cut the outer layers of the artery a quarter of an inch or so back of the intima, and thus leave a greater length of intima as a cuff, the back of which could be covered with vaselin, so that when invaginated into the vein it might stick to the venous wall and cover over the cut end of the outer portion of the artery.

18. **Glottic Spasm in Adults.**—Conlon reviews the clinical histories of 15 cases that have been reported in the literature and adds one personal case. The patient, female, aged 43, suffered from attacks of glottic spasm about two years, but did not seek relief until she had five or six attacks during 24 hours. Conlon cocainized and removed the anterior end of the middle turbinate, which cured the patient.

The Lancet-Clinic, Cincinnati.

August 10.

19 Typhoid Perforation with Operation. J. H. Greiwe, Cincinnati.
20 Multilocular Ovarian Cyst. A. H. Barkley, Lexington, Ky.
21 Hay Fever. E. S. McKee, Cincinnati.

Surgery, Gynecology and Obstetrics, Chicago.

July.

22 *The Teaching of Surgery. D. P. Allen, Cleveland, Ohio.
23 *Acquired Diverticulitis of Large Intestine. W. J. Mayo, L. B. Wilson and H. Z. Giffin, Rochester, Minn.
24 Continuous Passive Hyperemia in Delayed Union of Fractures. R. Roberts, Philadelphia.
25 *Aneurismal Varix. G. T. Vaughan, Washington, D. C.
26 *Rhinoplasty by Means of One of the Fingers. J. M. T. Finney, Baltimore, Md.
27 *Treatment of Posterior Capsule of Gland in Thyroidectomy. C. H. Mayo, Rochester, Minn.
28 *Case of Non-parasitic Cyst of Spleen. T. W. Huntington, San Francisco, Cal.
29 *End Results in Operation for Carcinoma of Breast. A. Vander Veer, Albany, N. Y.
30 Results of Operations for Carcinoma of Breast at Massachusetts General Hospital from 1894 to 1904. R. B. Greenough, C. C. Simmons and J. D. Barney, Boston.
31 *End Results in Operations for Carcinoma of Breast. A. F. Jonas, Omaha, Neb.
32 *End Results Following Operations for Carcinoma of Breast. W. Meyer, New York.
33 *End Results Following Operation for Carcinoma of Breast. F. S. Dennis, New York.
34 *Resection of Sound Femur in Gigantism and Asymmetry. R. W. Johnson, Baltimore.
35 *Brain Surgery. S. H. Weeks, Portland, Me.
36 *Diverticulum Ileï as Cause of Complete Intestinal Obstruction. F. H. Gerrish, Portland, Me.
37 *Prostatectomy. A. MacLaren, St. Paul, Minn.
38 *Congenital Dislocation of Hips. O. H. Allis, Philadelphia.
39 *Surgical Treatment of Cancer of Neck. G. Crile, Cleveland, Ohio.
40 *Desirability of Early Operations on the Nerves in Ischemic Paralysis. L. Freeman, Denver, Colo.
41 *Prolapse of Umbilical Cord. H. M. Stowe, Chicago.
42 Induction of Labor at Term. J. B. De Lee, Chicago.

22.—Abstracted in THE JOURNAL, June 1, 1907, page 1885.

23, 25, 27.—Abstracted in THE JOURNAL, June 8, 1907, page 1983.

26.—Abstracted in THE JOURNAL, June 1, 1907, page 1886.

28. **Cyst of Spleen.**—Huntington reports a case in which the symptoms strongly suggested a pancreatic cyst, although the early history of the case is more suggestive of splenic involvement. Over two gallons of dark-colored fluid were withdrawn from the cyst. The cyst wall was removed, and the operation was completed by excising the distal portion of the enormous cyst, puckering the cut margins with a purse-string suture, and finally marsupializing the remaining portion of the sac to secure external drainage. The subsequent history of the case was one of rapid and uninterrupted recovery.

29.—Abstracted in THE JOURNAL, June 22, 1907, page 2150.

31. **Cancer of Breast.**—Jonas' operative experience comprises 211 primary operations for cancer of the breast; 30 operations for local recurrences in his own cases, and 14 cases done primarily by other operators, totalling in all 255 cases. Out of this number there were 6 deaths, 2 from sepsis, 1 during a secondary operation, when a vein was punctured, admitting a large quantity of air, 1 due to an overdose of chloral, self-administered, and 1 from secondary hemorrhage on the thirteenth day. [The cause of death in the sixth case is not mentioned. —ED.] Among 177 cases of primary operation that could be traced after three years there were 38 recurrences in one year, and 34 during the second year, leaving 105 cases without recurrence at the end of three years. All the recurring cases

finally ended fatally. All the operations were done in the radical way, and in a number of instances portions of one or several ribs were removed whenever there was the slightest indication of the neoplasm having approached the rib.

32.—Abstracted in THE JOURNAL, June 22, 1907, page 2149.

33. Cancer of Breast.—The study of the end results, after many years, of 50 selected cases, has shown Dennis the following important clinical facts: 1. Cancer of the breast is sometimes permanently cured, or at least 25 years have elapsed with no evidence of a return. 2. Patients may go as long as 18 years and yet finally have a return in some other organ. 3. In the cases in which no return has been observed, the operation was performed, almost without exception, within six months from the incipiency of the disease, thus showing the great importance of early operation. 4. The more radical the operation within reasonable limits, the better the prognosis. 5. In some cases, in which the outlook was most unfavorable, as manifested by extensive ulceration, hemorrhage and widespread axillary involvement, the end results have been entirely satisfactory.

34.—Abstracted in THE JOURNAL, June 1, 1907, page 1886.

35.—Abstracted in THE JOURNAL, June 15, 1907, page 2069.

36.—Abstracted in THE JOURNAL, June 8, 1907, page 1984.

37. Prostatectomy.—MacLaren favors the perineal route for removing the prostate.

38.—Abstracted in THE JOURNAL, June 8, 1907, page 1983.

39. Carcinoma of Neck.—Crile considers that the chances for final cure following operations for cancer of the neck compare favorably with those of cancer of the breast. He has done 150 operations on 135 patients. The immediate use of the Roentgen ray applied on the naked wound is considered useful, and the creation of a granulation tissue barrier across the base of the neck to protect the mediastinum from invasion is advised, and its efficacy emphasized.

40.—Abstracted in THE JOURNAL, June 15, 1907, page 2069.

41. Prolapsus Funis.—Stowe describes his method of relieving this condition, and reviews briefly 51 cases. He also reports 3 cases in which normal salt solution was injected into the uterine cavity to take the place of the liquor amnii.

American Journal of Obstetrics, New York.

August.

42 Conservative Ovarian Surgery. C. R. Hyde, Brooklyn.
44 *Cases of Puerperal Eclampsia. H. G. Partridge, Providence, R. I.
45 *Polycystic Lutein Degeneration of Ovaries. S. Wiener, New York.
46 Hyoscine Anesthesia in Obstetrics. G. F. Butler, Wilmette, Ill.
47 Sins of Omission and Sins of Commission in Gynecology. G. H. Balleray, Paterson, N. J.
48 Labor in Contracted Pelves. K. C. McIlwrath, Toronto.
49 Treatment of Puerperal Infection. G. H. Noble, Atlanta, Ga.
50 *Malformation of Uterus. J. Milligan, Jacksonville, Ill.
51 *Menstrual Arthritis. J. D. Morgan, Washington, D. C.
52 Imperforate Vagina and Absence of Anus. E. T. Hargrave, Norfolk, Va.

44. Puerperal Eclampsia.—Partridge reports 37 cases of puerperal eclampsia that occurred in 883 labors, or one case to each 23.8 cases. Twenty-five patients, or 67.5 per cent., were primipara, and 12, or 32.4 per cent., were multipara. The average was 27.2 years. Of the 37 mothers, 12 died, a mortality of 32.1 per cent. Of the 34 children, living *in utero* at entrance to hospital, 14 died, a mortality of 41.1 per cent. Three were macerated when delivered. In 19 cases, or 51.3 per cent., the convulsions ceased with delivery. In 4 cases they seemed to increase in severity. In the 12 fatal cases the average number of convulsions was 12. In the 25 non-fatal cases the average number was 4.6. Nearly every patient was delivered manually, as soon as possible after entrance.

45. Polycystic Lutein Degeneration of Ovaries.—Wiener discusses this degeneration of the ovaries, which thus far has always been a concomitant of hydatid mole and chorioepithelioma.

50. Malformation of Uterus.—The two cases reported by Milligan are one of uterus didelphys and one of bicornute uterus. In the latter case the division began at the internal os.

51. Menstrual Arthritis.—Morgan reports 4 cases of arthritis in which the joint lesion seemed to be strongly associated or dependent on the menstrual function. Two of these cases are referred to as cases of precocious menstruation, as one patient began menstruating when 11 years and 9 months old, and the other at 12 years and 5 months. The other two patients were aged respectively 18 and 25 years. In one of the cases, for five months periodically, these pains in the joints returned at the menstrual period, and were best governed by putting the patient to bed the day before the expected menses, encouraging the menstrual flow, and sometimes administering salicylates. With all of these patients, although they have improved greatly, and go for months without arthritic pain at the menses, Morgan has noticed that a scanty menstruation or the avoidance of going to bed the first day or two of the menstrual flow, will often bring about fever, pain and swelling of the joints.

Annals of Surgery, Philadelphia.

August.

53 *Avulsion of Spine of Tibia. J. H. Pringle, Glasgow, Scotland.
54 *Osteogenesis Imperfecta and Idiopathic Fragilitas Ossium. C. C. Simmons, Boston.
55 *Traumatic Epithelial Cysts. L. Buerger, New York.
56 Radiographic Findings of Syphilis of Bones. M. W. Ware, New York.
57 *Correction of Certain Forms of Saddle Nose. I. Freeman, Denver, Colo.
58 *Intussusception. J. D. Rushmore, Brooklyn.
59 *Operation in Two Stages for Relief of Ileus of Jejunum. E. F. Robinson, Kansas City, Mo.
60 *Cyst of Urachus. T. L. MacDonald, Washington, D. C.
61 Chronic Cystic Ureteritis. B. Stow, New York.
62 *Operation for Hypospadias. R. H. Russell, Melbourne, Australia.
63 A Male Pseudo-Hermaphrodite. J. S. Stone, Boston.
64 New Retractor to be Used in Suprapubic Cystotomy. G. Walker, Baltimore.
65 *Multiple Fractures. A. P. C. Ashhurst, Philadelphia.
66 Fractures of Head and Neck of Radius. T. T. Thomas, Philadelphia.
67 *Isolated Fracture of Great Trochanter. G. E. Armstrong, Montreal.
68 Postoperative Treatment. J. H. Gibbon, Philadelphia.

53. Avulsion of Spine of Tibia.—Pringle adds one case of this kind to three thus far recorded in the literature. The patient received a severe blow on the outer aspect of the left knee joint. The knee became swollen from effusion into the joint cavity. The injury was thought to be a rupture of the internal lateral ligament. On opening the knee joint it was seen that the anterior crucial ligament still attached to its bone insertion had been torn off the tibia, carrying the spine with it. With a little trouble this was sutured and the wound closed. The man made a good recovery, and the knee troubles him only a little, at times, when coming down stairs.

54. Osteogenesis Imperfecta.—Simmons reports two cases, one in a girl 3 years of age, and the other in an infant of 10 months. This second patient died of a chronic bronchitis. A careful study was made of both cases, in the first by means of the radiograph, and in the second at the autopsy, and the findings are recorded in full.

55. Traumatic Epithelial Cysts.—Three instances of traumatic epithelial cysts are recorded by Buerger. In the first case the cyst was situated on the palmar surface of the last phalanx of the left index finger. It was easily removed by grasping its protruding portion with the forceps and pulling it out of its bed in the tissues. The unusual feature observed in this case was the fact that the cyst was nowhere covered by normal epidermis, and was lying partly without and partly within the tissues. In the second case the cyst was located as in the first case. At its most prominent part it presented a tiny opening, through which a white granular substance could be expressed. The tumor was excised, and was found to be filled with white granular cheesy material. In the third case, one of chronic mastitis, the cyst was situated under the skin of the breast near the axillary fold; it was incised, and was found to be filled with thick mucoid pus. The wall of the abscess was composed of squamous epithelial cells ranged in a manner closely resembling the epithelium of the skin.

57. Correction of Saddle Nose.—A new method of operating has been devised by Freeman. A short incision is made across the root of the nose between the eyes. Through this the skin is undermined along the bridge to the tip, and also well down the sides, if the skin requires much stretching. After the pocket beneath the skin has been prepared, the concavity of

the nose will necessitate the insertion of the plate at such an angle that its end will catch in the tissues, thus preventing it from sliding into position. In order to obviate this Freeman perforates the tip of the nose with the point of a large darning needle. The needle is then reversed and its blunt end pushed upward subcutaneously, until it passes out through the incision. On top of this needle, as a guide, the plate is easily slid into place. The wound is closed with a subcuticular suture or a little cotton and collodion. There is said to be no tendency to gaping, and only an insignificant scar results.

58. **Intussusception.**—Rushmore reviews the incidence and clinical history of intussusception, which, he says, is another name for internal strangulated hernia, as observed by him in 227 cases. Of this number, 14 cases occurred in the small intestine, 17 in the large intestine, and the remainder combined. He emphasizes the fact that treatment ought to be surgical and practiced within the first 12 hours, like the treatment of any other form of strangulated hernia. Laparotomy and manual reduction offer the patient the best chance of recovery.

59. **Ileus of Jejunum.**—Robinson reports a case, which illustrates the difficulty of determining, even at operation, the exact cause of obstruction, and demonstrates the wisdom of immediate drainage of the bowel, with secondary resection in critical cases of acute ileus in which the integrity of the intestine is questionable.

60. **Cyst of Urachus.**—MacDonald's patient was 40 years of age, and gave a history of a slowly growing abdominal tumor, beginning in the region of the bladder and growing upward, with the gradual onset of pressure symptoms, especially difficult respiration, pain and impaired digestion. The sac was situated in front of the peritoneum, but was surrounded by very firm adhesions. These were broken up with great difficulty, and the cyst removed. In the wall of the cyst were a number of nodules which proved to be papillomata. An interesting feature in the case was the failure of the peritoneum to absorb a large amount of normal salt solution with which the abdominal cavity had been filled. On the seventh day after the operation the patient presented symptoms of sepsis. The lower end of the wound was opened, allowing the escape of quarts of the salt solution, which had become purulent, and which presented the colon bacillus characteristics. Drainage and irrigation was continued for a week, after which the wound closed, and convalescence and return to health were satisfactory.

62. **Operation for Hypospadias.**—Russell describes a modification of his original method of operation, for the treatment of hypospadias. This method consists of two operations. At the first operation the penis is released and straightened and the glandular portion of the urethra is formed, and lined with preputial skin. At the second operation the perineal and penile portions of the urethra are formed and closed, so as to complete the channel from the perineal opening to the glandular urethra. For this operation suprapubic drainage is employed. A year or more, he states, should be permitted to elapse between the two operations.

65. **Multiple Fractures.**—Ashhurst presents an analysis of 240 cases, and reports 6 cases of multiple fractures of the upper extremity.

67. **Fracture of Great Trochanter.**—Armstrong reports the case of a man who sustained an injury of the right thigh, just behind the great trochanter, which resulted in a fracture of this process. The fracture was diagnosed by the Roentgen ray, clinical evidence practically being absent, except for limitation in motion of the leg.

Albany Medical Annals.

August.

69 **Physicians as Men of Letters.** A. S. M. Chisholm, Bennington, Vt.
70 **Therapeutic Value of Roentgen Ray.** A. Holding, Albany, N. Y.
71 *Primary Carcinoma of Uvula. C. F. Theisen, Albany.
72 *Brace for Treatment of Flat or Weakened Conditions of Feet. J. M. Berry, Troy, N. Y.

71. **Primary Carcinoma of Uvula.**—Theisen's patient was 52 years old. Symptoms incident to a growth in the throat had been felt for three months. On examination the uvula was seen to be transformed into a somewhat nodular, firm tumor. The growth had not quite extended to the soft palate, nor was there any induration of the surrounding tissue. No enlarged glands could be felt anywhere in the neck. The growth was removed, including a small portion of the soft palate. Fourteen months after the operation there was not the slightest indication of a recurrence. A microscopic examination of the tumor disclosed a carcinoma.

72. **Brace for Treating Flat Foot.**—Berry has modified his original brace for treating flat or weak foot. After the foot is oiled with vaselin, an outline of the brace, including both the arch-supporting portion and the base piece, is drawn on the foot with a dermatographic pencil and a plaster mold made of the arch of the foot, including the heel. In making the mold the leg is flexed at the knee and the foot rests on a support with its internal surface upward. The foot rests in a shallow, open, rectangular box, one long side of which has been removed. The ball of the foot rests against the long side of the box and the bottom of the heel is held about an inch from the side of the box. The back of the heel, however, rests against one end of the box. The space between the foot and the side of the box is filled with plaster cream, and the plaster cream is spread up over the foot to include the arch and heel. The dermatographic pencil outline of the brace transfers to the mold. The mold is coated with vaselin; the dematographic outline freshened and a plaster casting made. The dermatographic outline again transfers and following this outline a drawing of the brace is made on the cast. By making use of the dermatographic pencil outline as above described no mistake can be made by either the surgeon or instrument maker as to the proper position on the cast over which to fit a brace. The arch is cut out higher or shaped up as desired and the cast sent to the instrument maker. The instrument maker constructs a brace fitting the cast and following the outline drawn on it. Both the arch-supporting portion and the base piece are made of galvanized steel; the weight and strength of the steel depending on the weight of the individual for whom the brace is made.

Denver Medical Times.

August.

73 *Double Inguinal Hernia. J. Boice, Denver, Colo.
74 Impacted Tooth in Maxillary Sinus. T. E. Carmody, Denver, Colo.
75 Reflexes and Anesthetics. C. G. Parsons, Denver.
76 *Venesection in Pneumonia. V. Thompson, Englewood, Colo.
77 Double Infection—Scarlet Fever and Measles. T. S. Fants, Denver.
78 Diarrheal Disorders. R. J. Smith, Schenectady, N. Y.
79 Laboratory Diagnosis for Practitioner. J. C. Todd, Denver.

73. **Double Inguinal Hernia.**—In the case reported by Boice the sac on one side contained omentum, and that on the other contained the ascending colon, cecum and appendix, with a small portion of the ileum. The operation proved successful.

76. **Venesection in Pneumonia.**—In a typical case of lobar pneumonia Thompson opened the median basilic vein and allowed the patient to bleed until he complained of faintness. The effect was immediately noticeable on the pulse and general condition of the patient. On the third day after the initial chill the temperature dropped to 100 F.; on the fourth day the patient got out of bed, and on the eighth day he drove six miles to the doctor's office and was discharged.

Utah Medical Journal, Denver, Colo.

August.

80 *Need of Earlier Diagnosis. J. N. Hall, Denver.
81 Case of Lipoma of Spinal Cord. E. F. Root, Salt Lake City.

80.—This article also appeared in the *Medical Record*, Aug. 3, 1907.

The Northwestern Lancet, Minneapolis.

July 1.

82 Public Care and Treatment of Insane. O. Copp, Boston, Mass.
83 Artificial Congestive Hyperemia, after Professor Bier. H. A. H. Bouman, Minneapolis.
84 Clinical Symptoms and Diagnosis of Diphtheria. E. K. Green, Minneapolis.
85 Fractures. A. E. Hedback, Minneapolis.
86 Pneumodiplococcic Infection of a Clean Wound. J. H. Beaty, St. Cloud.

July 15.

87 President's Address of South Dakota State Med. Assn. E. T. Ramsey, Clark, S. D.
88 Diagnosis and Treatment of Gastric Ulcer. J. W. Bell, Minneapolis.

August 1.

89 **Infection of Uterus.** G. C. Bayton, Minneapolis.
90 **Hospitals for Acute and Removable Insane.** A. M. Barrett, Ann Arbor, Mich.
91 **What Should the Practitioner Read?** C. E. McCauley, Aberdeen, S. D.
92 *Cretinism or Infantile Myxedema. W. Edwards, Bowdle, S. D.
93 Medical Expert Witness. T. L. Hatch, Owatonna, Minn.
94 *Rupture of Liver with Recovery. W. H. Aurand, Minneapolis.
95 *Double Congenital Anterior Subluxation of Knees. E. S. Geist, Minneapolis.

92. **Cretinism.**—Edwards reports the case of a girl, a cretin, 8 years old, who showed great improvement in her physical condition after ten months of irregular thyroid treatment. During the first four months of treatment the patient grew four inches. She did not, however, make any very great progress intellectually.

94. **Rupture of Liver.**—Aurand reports the case of a man who sustained a rupture of the liver following a severe fall on the abdomen. Three days after the injury the abdomen had become so distended with fluid that a laparotomy was done. The abdomen was full of dark blood, and a band of adhesions was found around the cecum, which caused a total obstruction of the bowel, which set in after the injury. The rupture in the liver was large enough to contain the hand of the operator. The abdomen was washed out with normal saline solution, after the adhesions were removed, and the wound was closed without drainage. In spite of a localized suppurative peritonitis the patient eventually recovered.

95. **Double Congenital Anterior Subluxation of the Knees.**—In the case reported by Geist, an infant, 10 months old, there was present at birth hyperextension with total impossibility of flexion at the knees, and extreme pes equinus. When the patient was first seen, the knees were held in an extended position and could be flexed only slightly, without causing pain. A certain degree of hyperextension could be produced passively. There was little range of active motion. Geist believes that the cause of the condition in this case was the abnormal position of the fetus *in utero*, together with the increase of intra-abdominal pressure. So far nothing has been done to correct the deformity.

The Military Surgeon, Carlisle, Pa.

July.

96 **Training of Medical Officer of State Forces Best to Qualify Him for Local Service and for Mobilization with National Troops.** J. E. Pilcher, Carlisle, Pa.
97 **French Impressions of the Surgery of the Russo-Japanese War.** C. S. Butler, Mass. Volunteer Militia.
98 **Work of Army Board for Study of Tropical Diseases in the Philippines.** P. M. Ashburn and C. F. Craig, U. S. Army.
99 **Epidemic of Cerebrospinal Meningitis at the U. S. Naval Training Station at Newport, R. I.** N. J. Blackwood, U. S. Navy, and others.
100 **Treatment and Prevention of Surgical Shock.** J. L. Medina, Nicaragua.
101 **Case of Traumatic Displacement of Right Kidney with Rupture of Right Lower Lobe of Liver.** M. W. Houghton, U. S. P. H. and M.-H. S.

August.

102 **Splenic Abscess as Complication of Grave Malarial Infection.** W. H. Bell, U. S. Navy.
103 **Wounds of Colon Treated without Operation.** P. R. Egan, U. S. Army.
104 **Epidemic of Cerebrospinal Meningitis Occurring at U. S. Naval Training Station at Newport, R. I.** N. J. Blackwood, M. S. Guest, J. H. Iden and J. L. Nellson, U. S. Navy.
105 *Use of Amyl Nitrite for Control of Hemorrhage in Bullet Wounds of Lung. E. A. Sweet, U. S. P. H. and M.-H. S.
106 **Mexican Model of Military Medicine Chest.** A. Ross, Mexican Army.
107 **Infantile Scorbutus.** W. P. Chamberlain, U. S. Army.
108 **Service of Michigan National Guard in Mobilization at Fort Benjamin Harrison.** J. F. Henkel, Mich. N. G.
109 **Tropical Diseases in Philippines.** P. M. Ashburn and C. F. Craig, U. S. Army.

105. **Amyl Nitrite to Control Pulmonary Hemorrhage.**—Sweet records excellent results following the use of amyl nitrite in cases of hemorrhage following bullet wounds of the lungs. Use is made of the 5-minim pearls. The administration is the same as in cases of asthma or angina pectoris. When it is desired to maintain the effect, Sweet administers nitroglycerin and sodium nitrite in small and oft-repeated doses.

American Medicine, Philadelphia.

July.

110 **Relation of Incorrect and Correct Refraction to Systemic Diseases.** G. M. Gould, Philadelphia.
111 *Transvesical Operation for Relief of Prostatism in the Aged. C. E. Bowers, Wichita, Kan.
112 **Inflammation of Air Passages within Lung.** W. H. Birchmore, Brooklyn.
113 **Formation of Fat Globule of Milk.** H. B. Wood, Philadelphia.
114 *Lorenz Operation for Bloodless Reduction of Congenital Hip Dislocation. W. G. Stern, Cleveland, O.
115 **Scirrhus Cancer Simulating Hypertrophic Stenosis of Pylorus.** F. H. Murdoch, Pittsburg, Pa.

111. **Transvesical Operation for Prostatism.**—In twelve consecutive cases of senile prostatism, in which an operation was done by Bowers, there was relief of prostatic symptoms, ability to empty the bladder by urethra without pain, and the termination of the cystitis, without mortality or sequels. Bowers emphasizes first, that prostatism is due to other causes than hypertrophy of the prostate gland; second, that the transvesical operation for prostatism has attained a sufficient degree of perfection to be recommended to this class of pitiable sufferers, with the assurance of a cure if availed of before the inflammatory process has reached the kidney and arrested its functional activity; third, that these patients should not be submitted to catheterism in the future as they have in the past, until it is hopeless to interfere surgically.

114. **Lorenz Operation in Congenital Hip Dislocation.**—Stern commends very highly the Lorenz operation for the bloodless reduction of congenital hip dislocation. He has made use of the method in 12 cases, with 6 anatomic cures, 1 perfect functional result, 3 good functional results, and transposition with good function, and 1 failure.

Wisconsin Medical Journal, Milwaukee.

July.

116 **Psychotherapy.** F. C. Studley, Milwaukee.
117 *Prolapse of Umbilical Cord. J. H. Sure, Milwaukee.
118 **Professional Fellowship.** F. W. Epley, New Richmond, Wis.
119 **Breech Presentation.** G. A. Hipke, Milwaukee.

117. **Prolapse of Umbilical Cord.**—Sure reports four cases with a fetal mortality of 50 per cent. None of the mothers died. They were all multipara, and in each case previous labors had been normal. Sure presents a very complete review of the literature on this subject, and recommends the following method of procedure in individual cases: In absence of signs of compression, transverse presentation or incomplete dilatation, wait for sufficient dilatation, and when considered sufficient, turn and extract immediately. If compression occurs during this period, turn, replace the cord, bring down one foot and do not extract until dilatation is complete. The reposition should be done after the version. When the breech is brought over the inlet, replace the cord and engage the breech thus blocking its way. Reposition as the operation of election is useless, for the prolapse will recur.

Interstate Medical Journal, St. Louis.

August.

120 **A Medical Career and the Intellectual Life.** C. A. Wood, Chicago.
121 *Statistical Study of Relation between Height of Longitudinal Arch and Functions of Foot. P. Hoffmann, St. Louis.
122 **Two Cases of Infection with a Gas-Forming Bacillus; Recovery.** R. C. Loving, U. S. Army.

121. **Relation Between Height of Longitudinal Arch and Functions of Foot.**—While examining the feet of primitive peoples the great variety of impression records obtained from feet that were functionally normal led Hoffmann to study statistically the question of relation between the height of the longitudinal arch and the usefulness of the foot. His findings are contained in the following summary: 1. There is no one type of arch that is normal. 2. Contrary to common opinion and teaching, the height and shape of the longitudinal arch are of no value in estimating the strength or usefulness of the foot. 3. Normal feet present high, medium and low arches in nearly the same proportions as do feet with weakened arches. 4. Weakness of the longitudinal arch rarely results in its depression, and flat foot as a pathologic entity is not common. 5. The impression records of the longitudinal arch, commonly made by surgeons, are of no value in the diagnosis of arch strain or weakness, so-called flat foot, whose symptoms are dependent on a weakened arch and not on its lowness except in so far as this lowness is a transition from an original higher condition with concomitant change in the relationship of the tarsal bones, which transition occurs by far less often than is generally believed.

Journal Missouri State Medical Association, St. Louis.

August.

123 *Surgical Treatment of Enlarged Prostate. C. E. Fulton, Springfield, Mo.
124 *Prostatectomy. C. F. Roberts, Kansas City, Mo.
125 Forms of Scabies as Seen in Private Practice. W. Frick, Kansas City, Mo.
126 The Medical Profession and the Law. B. B. Cahoon, Sr., Fredericktown, Mo.
127 Mastoiditis with Pyuria and Intermittent Heart Beat. J. S. Wever, Kansas City, Mo.

123. Surgery of Prostate.—Fulton emphasizes the advantage of prostatectomy over what he terms the slipshod habit of providing the prostatic with a catheter to be used by himself at his own pleasure.

124. Id.—Roberts commends the perineal route as being vastly superior to the suprapubic, because the former provides a natural drainage.

American Quarterly of Roentgenology, Pittsburg.

No. 3.

128 Standardization of Radiations. C. E. S. Phillips, London, England.
129 *Estimation of Roentgen Dosage. H. G. Piffard, New York.
130 *New Direct Reading Roentgen Ray Meter. G. C. Johnson, Pittsburg, Pa.
131 Résumé of Radiometric Dosage of Roentgen Therapy. M. K. Kassabian, Philadelphia.
132 Advantages of Use of Roentgen Ray Filters in Radiotherapeutics. R. Morton, London.
133 *Changes Produced in Kidneys by Roentgen Irradiation. A. S. Warthin, Ann Arbor, Mich.
134 *The Roentgen Ray in Diseases of Blood and Blood-Forming Organs. H. K. Pancoast, Philadelphia.
135 Present Status of Roentgen Therapy. G. H. Stover, Denver, Colo.

129, 130.—Abstracted in THE JOURNAL, Sept. 15, 1906, page 888.

133, 134.—Abstracted in THE JOURNAL, Sept. 15, 1906, page 889.

West Virginia Medical Journal, Wheeling.

July.

136 President's Address, West Virginia State Med. Assn. W. W. Golden, Elkins, W. Va.
137 Ten Years' Experience in Obstetrics. C. B. Williams, Philippi, W. Va.
138 Amebic Dysentery in Sailors at Port of New York. J. A. Sydegger, U. S. P. H. and M.-H. S.

Iowa Medical Journal, Des Moines.

July.

139 Medical Jurisprudence. A. P. Olsen, Leon, Iowa.

Maryland Medical Journal Baltimore.

July.

140 The Logical Basis of Neurasthenia. A. K. Bond, Baltimore, Md.
141 Dislocation of a Cartilage Ring of Trachea Causing Loss of Voice. S. B. Muncaster, Washington, D. C.

Journal of the Michigan State Medical Society, Detroit.

July.

142 *Methods of Diagnosis. J. B. Herrick, Chicago.
143 *Use of Bacterial Vaccines in Surgery. W. H. Hutchings, Detroit.
144 Therapeutic Bacterial Inoculation With and Without the Opsonic Index as a Guide. A. P. Ohlmacher, Detroit.
145 Examination of the Insane. J. F. Canavan, Traverse City.
146 Résumé of Some Accomplishments of the Michigan State Board for 1906. R. D. Harison, Detroit.
147 Examination of Patients Suffering from Stomach Disorders. H. Van den Berg, Grand Rapids.
148 *Empyema. R. Y. Ferguson, Pontiac.

142.—Abstracted in THE JOURNAL, July 6, 1907, page 71.

143.—Abstracted in THE JOURNAL, July 13, 1907, page 178.

148.—Abstracted in THE JOURNAL, April 13, 1907, page 1292.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London.

July 27.

1 Outbreak of Epidemic Cerebrospinal Meningitis. W. Robertson.
2 *Ocular Symptoms in Cerebrospinal Meningitis. A. J. Ballantyne.
3 Infective Cyclitis in Relation to Penetrating Wounds of Eyeball. P. Dunn.
4 Medicine in Ancient Greece. G. Lorimer.
5 *Abnormal Fat Assimilation Associated with Diseases of Intestine. O. T. Williams.
6 *Etiology and Pathologic Histology of Beriberi. R. T. Hewlett and W. E. Korté.
7 *Arthritis and Erythema Nodosum. J. O. Symes.
8 *Interstitial Pancreatitis in Relation to Sprue. A. W. M. Robson.
9 *Hypertrophic Cirrhosis of Liver in Infant. H. S. Willson.
10 *Poisoning by Bromoform. M. Benson.
11 Cases Treated by Isacterial Vaccines. M. L. B. Rodd.

2. Ocular Symptoms in Cerebrospinal Meningitis.—Ballantyne investigated the condition of the eyes in 73 cases of cerebrospinal meningitis, including patients in all stages of the disease. Eye symptoms of any kind were absent only in four cases, two of these patients being convalescent. Abnormalities of the palpebral fissures were noted in 17 cases; retraction of the eyelids in 15 cases; acute catarrhal conjunctivitis in 13 cases; corneal ulcer in one case; inequality of the pupils in 18 cases; strabismus in 15 cases. Ballantyne says that, perhaps, the most striking feature was the great variations in the symptoms in the same patient from day to day, and even in the course of a single examination. No evidence of iritis, cyclitis or chorioiditis was found in any of the cases. Among other symptoms noted were blepharospasm, changes in the pupil reflexes, optic neuritis, conjunctival hemorrhages, and faulty muscle action. As to the bearing of these symptoms on prognosis, Ballantyne expresses the opinion that retraction of the eyelids, corneal complications, absence of the pupil reflexes, true nystagmus, lid winking, combined with jerky movements of the eyes, and optic neuritis are among the symptoms of graver significance.

5. Abnormal Fat Assimilation.—The observations recorded by Williams tend to show that there are conditions in the intestines, in which certain soaps or other insoluble compounds of fatty acids are not absorbed by the intestinal mucous membrane, and that with the presence of these conditions, certain diseases of the alimentary tract are related. The analyses given show that true intestinal sand, appendix concretions, and some bodies formed in the intestine are largely formed of fat and soaps. Williams believes that the constitution of these bodies and their relation to each other in chemical constitution throws much light on the etiology of appendicitis and mucous colitis, and possibly on the underlying factors in certain diseases accompanied by colic.

6. Beriberi.—Hewlett and De Korté suggest that beriberi is a protozoan infection, that the infecting agent is eliminated in the urine, and that the urine is the source of infection.

7. Arthritis and Erythema Nodosum.—Symes says that in a large proportion of cases of erythema nodosum it is difficult to recognize any rheumatic taint, and that even when arthritis is present, it may differ very remarkably from that found in acute rheumatic fever. His experience has been that the signs or a history of chorea, endocarditis or arthritis, are not found in more than 10 per cent. of all cases of erythema nodosum.

8. Pancreatitis and Sprue.—Robson thinks that it is highly probable that some of the cases diagnosed as sprue owe their origin to inflammatory disturbance of the pancreas, and that in other cases the pancreatic disease forms an important complication requiring treatment.

9. Cirrhosis of Liver.—Willson records a case of congenital syphilitic cirrhosis of the liver, which proved fatal to a child three months old. He believes that the changes in the liver probably commenced during intrauterine life. The liver is said to have been of enormous size, but unfortunately was not weighed.

10. Bromoform Poisoning.—In the case reported by Benson, the bromoform was administered to a child ill with whooping-cough. The maximum dose was one minim. The author fails to mention the number of doses given, but cautions against the use of the drug.

The Lancet, London.

July 27.

12 Plague. W. J. R. Simpson.
13 General Surgical Anesthesia. F. W. Hewitt.
14 *Carriage of Infection by Flies. R. M. Buchanan.
15 *New Microscopic Diagnostic Method and Simple Methods for Staining Liquid Blood. R. Ross, J. E. Slavin-Moore and C. E. Walker.
16 *Case of Cerebrospinal Meningitis. C. Rundle, J. C. Mottram, R. S. Williams, J. Orr, A. E. Williams.
17 Study of Conditions Producing Anomalous Reaction in Testing Urine for Sugar with Fehling's Solution. (To be continued.) F. W. Pavy.

18 Cerebral Meningitis During Pregnancy. J. D. Williamson.
19 Treatment of Trypanosomiasis. A. Nierenstein.
20 *Cerebral Hyperemia as Factor in Therapeutic Action of Lumbar Puncture. F. C. Eve.

14. **Carriage of Infection by Flies.**—Buchanan records experiments in demonstration of the part which the common house fly and the blue-bottle fly are capable of playing as agents in carrying and spreading infection. The diseases which were made the subject of experiments were typhoid, swine fever, staphylococcal abscess, pulmonary tuberculosis and anthrax. The experiments showed that flies alighting on any substance containing pathogenic germs are capable of carrying away these organisms in large numbers on their feet and of depositing them in gradually diminishing numbers on surface after surface with which they come in contact. They further demonstrate the necessity of the exercise of stringent measures to prevent the access of flies to all sources of infection and to protect food of all kinds against flies alighting on it.

15. **New Microscopic Diagnostic Method.**—The authors of this communication, Ross, Moore and Walker, again call attention to certain strings of granules called by them chromolinin granulations, which can be found by means of appropriate staining in some of the red corpuscles in health and disease. They infer that an excessive percentage of corpuscles with the granulation is indicative of the discharge of the red corpuscles into the blood stream at an earlier stage in their development than usual, due probably to processes of blood construction and regeneration. In health these granulations occur in about 1 per cent. of the corpuscles. In a case of tropical abscess of the liver they were found in 6.6 per cent.; in a case of chronic malarial anemia in 11.5 per cent., while in ankylostomiasis, kala azar and rats with trypanosomes and spirochetes, they were detected very frequently. The stain used is a polychrome saturated solution of methylene blue, in 0.5 per cent. salt solution.

16. **Cerebrospinal Meningitis.**—Rundle, Mottram and Williams report a case of cerebrospinal meningitis from which the specific organism was isolated, and the patient treated successfully with a vaccine made from cultures of the germ in sterile normal saline solution.

20. **Cerebral Hyperemia and Lumbar Puncture.**—Eve considers it justifiable to try lumbar puncture in a variety of acute or subacute cerebral affections, which have resisted other treatment or are tending to become chronic. He states, however, that it should not be tried until other remedies have failed.

Journal of Tropical Medicine and Hygiene, London

July 15.

21 Plague. W. J. Simpson.
22 Psycho-physical Aspects of Climate. F. Pearse.

International Medical Journal of Australasia, Melbourne.

June 20.

23 *The Cecum and Vermiform Appendix. R. J. A. Berry.
24 *Acute Appendicitis in Childhood. F. H. Cole.
25 *Gastrectomy for Carcinoma of the Stomach. G. A. Syme.
26 *Case of Podalgia. F. Bird and J. Smith.
27 Classification of Disease and Causes of Death. G. H. Knibbs.

23. **Cecum and Vermiform Appendix.**—Berry discusses the embryology and anatomy of these two structures as they are understood at the present time.

24. **Acute Appendicitis in Childhood.**—Cole discusses the clinical history of acute appendicitis in children. He says that aperients are to be avoided even though constipation exists after improper feeding, and that every case should be deemed surgical ,with a view to operation, immediate or deferred. Waiting, he says, is permissible only for the purpose of securing an improved condition of the patient. Operation should be done within twenty-four hours, if the diagnosis is absolute, and should be done in every case after one attack.

25. **Gastrectomy for Carcinoma of the Stomach.**—Syme is satisfied that if cases of cancer of the stomach came to operation early the recurrence would be delayed. He believes that as much as possible of the stomach should be removed, even beyond the Hartmann-Mikulicz line. He reports five cases.

26. **Podalgia.**—Bird and Smith report four cases of podalgia, in which they refer the pain to spicular osseous prolongations from the hinder end of the os calcis which were present in each case. All other causes for the affection could be ruled out. The symptoms were the same in all the cases: Pain in the heel of slow onset and of gradually increasing severity, referred to the hinder end of the os calcis, with severer paroxysms radiating to the rest of the foot. The spikes of bone were removed through a small lateral incision, parallel to the border of the sole and carried down to the calcaneal tuberosity. The patients remained in bed for a few days and then resumed their ordinary duties.

Clinical Journal, London.

July 3.

28 Injuries to Superficies of the Eye. N. B. Harman.

Presse Médicale, Paris.

29 (XV Nos. 41-43, pp. 349-352.) *Sero-reaction in Syphilis. (Séro-réaction de la syphilis.) C. Levaditi.
30 *Puncture Better than Scarification for Revaccination. (Piqure ou grattage?) Saint-Yves Ménard.
31 Appendicular Dyspepsia. (Dyspepsie app.) J. Foucaud and L. Saligmat.
32 Case of Perforation of Epigastric Artery in Abdominal Paracentesis. (Perforation de l'art. epigastrique.) C. Lian.
33 *Palliative Surgical Treatment of Cancer of Cervix. (Castration ovarienne; ligature des hypogastriques; curage du col.) F. Jayle.
34 *Congenital Cardiovascular Affections in Inherited Syphilis. (Affections cardiovasc. cong. hérd.-syph.) L. Landouzy and Laederich.

29. **Sero-Reaction of Syphilis.**—Levaditi reviews what has been accomplished with the hemolytic blood test and its history, adding that the method is too complicated for general use and that efforts should be directed now toward simplification of the technic.

30. **Puncture or Scarification in Revaccination.**—Ménard advocates a prick or pricks rather than scratches in revaccinations. Inflammatory phenomena are too liable to accompany the scarification, as the vaccinal reaction is needlessly intense and extensive in this case. When the vaccine is just pricked in, the reaction is reduced to the minimum and complications are avoided.

33. **Palliative Treatment of Cancer of the Uterine Cervix.**—Jayle points out that in women who are still menstruating a cancer generally runs a more rapid course. For this reason he advises removal of both ovaries. In addition, to reduce the flow of blood to the neoplasm he applies a double ligature to both of the hypogastric arteries, leaving a space of about 1 cm. between the ligatures. All this is easily done when the abdomen is opened and the growth found inoperable. If the surface of the growth indicates it, he curettes away the epitheliomatous vegetations and cauterizes with the actual cautery.

34.—See summary in THE JOURNAL, July 6, 1907, page 91.

Revue de Chirurgie, Paris.

35 (XXVII, No. 5, pp. 713-896.) *Persistent Priapism. (Priapisme prolongé.) F. Terrier and C. Dujarier.
36 *Ruptures of Lung without Fracture of Ribs. (Ruptures du poumon sans fractures de côte.) A. Schwartz and P. Dreyfus.
37 *Perineal Extirpation of Cancers of Anus and Rectum. (Extirpation périnéale.) X. Delore and A. Chalier.
38 *Treatment of Glandular Cysts of Pancreas. (Kystes gland. du pancréas.) P. Hardouin.

35. **Persistent Priapism.**—Terrier and Dujarier give the details of a case of idiopathic persistent priapism and summarize 48 cases of this condition found in the literature. In 16 of the 48 cases the condition was referable to leukemia; in 2 to a fall on the perineum or kick from a horse, and in 20 no cause could be discovered. The postmortem findings in 4 cases and the undings during operations in 10 others are reviewed. Good results were obtained in 3 out of the 10 cases treated by incision of one or both corpora cavernosa. Unfortunately, conditions in the parts favor infection. In 2 cases the colon bacillus was found in the blood at the first incision. In the case described there was suppuration, and part of the right corpus cavernosum was thrown off in an eschar, after which healing proceeded rapidly, with no recurrence of the priapism.

36. **Ruptures of Lung Without Fracture of Ribs.**—Schwarz and Dreyfus report a case in which a young teamster was run over by his wagon, the wheel passing over the chest from the left side. No trace of fracture could be discovered, but the patient complained of intense pain in his chest, and there

was considerable cyanosis and blood-stained expectoration. A large subcutaneous emphysema developed soon after the accident, starting at the base of the neck, with hemo-pneumothorax. Autopsy two days later revealed numerous small tears in the lungs without any considerable hemorrhage. Twenty-nine cases of similar contusion of the lung without fracture of ribs are on record. The elasticity of the chest walls in youth explains the absence of fractures, but the costal cartilages may be dislocated as was noticed in the case reported. The prognosis is always grave, although recoveries have been observed. Death occurs from asphyxia or hemorrhage or from infectious complications. Pneumonia is favored by the accumulation of blood and even after healing a place of lesser resistance is left, predisposing to tuberculosis. Emphysema, starting in the neck, is an important differentiating sign. Treatment is symptomatic, puncture or pleurotomy should be avoided if possible as liable to be followed by infection. In one case on record, the pleura was opened after resection of the fifth rib, but no rupture was found. A large stiff drain was left in the wound, the outer end being inserted in a soft depressible tube. The air emerged through the drain during expiration, but did not enter during inspiration, as the outer tube collapsed. This patient recovered. The authors state that no attempt should be made to suture the wound in the lung unless to arrest fulminating hemorrhage. Under other circumstances repose and one or more punctures will suffice. Richter sutured the lung in his case, but the patient died in two days.

37. **Removal Through Perineum of Cancers of Rectum and Anus.**—Delore and Chalier relate the particulars of 19 cases in which they performed this operation. All but 5 of the patients were women, and all but one were over 50. The patient lies on his back, the hips projecting beyond the edge of the table. The thighs are held by assistants, flexed on the pelvis in such a way that the anus protrudes and points upward. It is sutured together and an incision is made encircling the anus, with a lengthwise median extension below and above, the latter incision extending to the coccyx. The coccyx is resected at its base and the entire rectum, with its sheath and ganglia, is extirpated in a single piece. The resection of the coccyx facilitates the detachment of the rectum, which is commenced at the back, and thus better insight over the conditions is obtained. One of the patients thus operated on eight years ago is still in good health, and another, who succumbed to intercurrent tuberculosis a year and a half after the operation, showed no signs of recurrence. One patient operated on four years ago is in good health to date, and is free from incontinence. Two patients succumbed soon after the operation, one to acute peritonitis when all seemed to be doing well, and another in collapse after a comparatively simple operation. The ultimate outcome is not known in five cases, but in none of the others has there been recurrence. The details of the various cases are given, with a summary in tabulated form for comparison.

38. **Treatment of Glandular Cysts of the Pancreas.**—Hardouin diagnosed a fluid tumor behind the stomach, probably in the pancreas or lower part of the liver. Through a median laparotomy the tumor was punctured and two liters of a turbid, greenish-brown fluid were evacuated. The cyst was then incised and sponged dry, but it could not be removed, as it was adherent to the stomach and adjacent structures. An incision, 15 cm. long, was then made in the lumbar region, and two large drains were introduced into the cyst, after which the abdominal wound was sutured. The lumbar fistula healed completely in three months, and the patient, a farmer of 48, has been in good health since. There was a history of contusion a few months before the tumor was first noticed, and traumatism was also mentioned in 17 out of 94 cases on record. The fluid obtained from the cyst was evidently of pancreatic origin. Lumbar drainage should be the rule, Hardouin thinks, in all cases of pancreatic cysts, for obvious reasons. He appends the bibliography for the last six years.

Dermatologische Zeitschrift, Berlin.

39 (XIV, No. 2, pp. 67-130.) Relations of Pale Spirochete to Skin Pigment in Syphilitic Efflorescences. (Beziehungen der Sp. pall. zum Hautpigment.) B. Lipschütz.

40 Spirochetal Affections. (Spirochaetenerkrankungen.) G. Scherber.

41 Histology of Verrucous Lichen Ruber. (Lichen rub. verr.) M. E. Polano.

42 (No. 3, pp. 131-196.) *How to Make Colored Wax Casts. (Farbige Wachsabdrucke.) G. T. Photinos.

43 Five Cases of Paraurethral Suppuration in Women. (Paraurethrale Eiterung.) O. O. Fellner.

44 (No. 4, pp. 197-262.) *New Infection of Persons with Inherited Syphilis and Reinfection in General. (Neuinfektion Hereditärsyphilitiker und Reinfektion.) C. Stern.

45 Three Cases of Psoriasis in Infants. (Psor. vulg. bei Säuglingen.) A. Friederichs.

46 (No. 5, pp. 263-328.) A Vacciniform Skin Eruption. (Hydroa vacc.—Bazin.) M. Wolters.

42. Wax Casts of Dermatologic Specimens.—Photinos took a course of training in making casts under Lassar's modeler, and has since been making a collection which now amounts to 150 casts. The modeler at the Saint-Louis Hospital in Paris keeps the composition of his wax a secret, but at Berlin a mixture of wax, ceresin and paraffin is used. Photinos expatiates on the invaluable assistance of a collection of such casts for the practitioner and specialist, and then gives minute directions how to make the wax casts and paint them.

44. New Infection of Persons with Inherited and Acquired Syphilis.—Stern's patient was a man of 28 who had a primary syphilitic sore with numerous pale spirochetes, differing in no respect from an ordinary primary infection with syphilis; and yet the man presented the unmistakable signs of inherited syphilis or syphilis acquired in early infancy, with tertiary phenomena. This makes the ninth case on record, Stern remarks, in which persons with syphilis in infancy, either inherited or acquired during the first weeks of life, acquired a fresh infection in early adult life. He summarizes 80 cases of reinfection in cases of acquired syphilis, and draws the conclusion that the reinfection in many instances is conclusive testimony to the complete cure of the primary infection. He emphasizes the necessity for teaching patients this, so that those who have had syphilis in the past may guard against contracting it anew instead of considering themselves immune. His experience also indicates that a strong, resistant organism may pass through syphilis with the organs comparatively intact and escape the dreaded consequences. The pessimistic idea that a person once infected is always infected and immune to future infection should be combated, he declares, for numerous and obvious reasons.

Deutsche medizinische Wochenschrift, Berlin and Leipsic.

47 (XXXIII, No. 24, pp. 953-992.) *Malingering and Its Detection in Internal Medicine. (Krankheitssimulation und dissimulation und ihre Entlarvung in der inneren Medizin.) Rumpf.

48 *Detection of Simulation in Mental Affections. (Entlarvung von Simulation bei Geisteskranken.) M. Köppen.

49 *Detection of Malingering in Industrial Accident Surgery. (Simulation und ihre Entlarvung in der Unfallchirurgie.) G. Ledderhose.

50 *Detection of Malingering in Eye Affections. (Augenleiden.) Groenouw.

51 *Detection of Malingering in Ear Affections. (Ohrkrankheiten.) Stenger.

52 *Malingering Among Soldiers. (Simulation beim Militär.) Schill.

47 to 52. **Malingering.**—The German legislation for compulsory insurance against old age, industrial accidents and sickness has led to simulation of various affections by the insured in many instances or to malingering in other ways to obtain the sick benefit or indemnity. This number of the *Deutsche med. Wochenschrift* is almost entirely devoted to the subject, treated from the standpoint of various specialties.

Deutsche Zeitschrift f. Chirurgie, Leipsic.

53 (LXXXVII, Nos. 1-3, pp. 1-32 312.) *Treatment of Injuries of Radial Nerve. (Verletzungen des N. radialis.) Borchard.

54 Hydro-pyo-nephroses and Renal Calculi. (Beiträge zur Nierenchirurgie.) H. Doering.

55 Traumatic Ruptures of Liver with Expulsion Later of Large Sequesters of Liver Substance. (Leberrupturen.) J. Fertig.

56 Pathology of Alveolar Echinococcus. (Alveolarechinococcus.) A. Jenckel.

57 Exposure of Central Part of Middle Cranial Fossa and Hypophysis. (Freilegung der Schädelgrube, etc.) W. Braun.

58 Appendicitis and Icterus. (App. und Ikt.) G. Aldehoff.

59 Ileus with Appendicitis. (Ileus bei App.) H. Haeckel.

60 Meckel's Diverticulum as Cause of Ileus. (Meckelsches Div. als Ursache des Darmverschlusses.) A. Jäckh.

61 Spontaneous Gangrene of Finger Tips of Left Hand. (Spon. Gang. an einzelnen Fingerkuppen.) Evers.

62 Tumors of Scrotum. (Haemo-Lymphangioma cavernosum partim cystoides scroti.) W. Rosenberger.

63 Bilateral Lacerated Fracture of Tubercle of Tibia. (Risfraktur der Tub. tibiæ.) F. Linkenheld.
64 *Surgery in Naval Warfare. (Seekriegschir.) Matthiolus.
65 *Operative Treatment of Gastric Cancer. (Chir. des Magencarcinoms.) O. Creite.

53. Injuries of Radial Nerve.—The ultimate outcome of operative treatment was a complete cure in the three cases reported. Great care was taken to remove all proliferation of bone, sharp edges of bone and cicatricial tissue in the soft parts, and to ensure perfect healing of the wound with the nerve adjusted between muscular tissue in such a way that further injury would be avoided. Borchard asserts that direct union of the severed stumps is preferable to all plastic operations, and that it is advisable to resect the bone if necessary to obtain direct union. It is generally impossible to stretch the nerve to bridge a gap of more than 2 or 3 cm., although von Bergmann accomplished it with a defect of 7 cm. by extreme flexion of the wrist. Primary suture is more promising than later operations if asepsis can be secured. The earlier the operation the better the ultimate functional outcome. In 12 cases Borchard sutured the severed nerve in 2; in 3 cases mobilization of the nerve from adhesions proved sufficient; in 3 others cicatricial tissue had to be excised and the nerve imbedded in muscle tissue; in another case the dislocated head of the radius had to be resected, and in another a nerve-grafting operation was required to bridge a gap of 11 or 12 cm. The after-treatment is extremely important, regenerative processes should be stimulated by massage and baths which also prevent contraction of the muscles and stiffness of the joints. This should be supplemented by electricity to hasten restoration of conductibility.

64. Surgery in Naval Engagements.—Matthiolus discusses the experiences on the battleships during the Russo-Japanese war and says that they teach that the ship surgeon should thoroughly instruct the crew in the principles of first aid to the wounded, so that they could take better care of themselves and others in case of injury. One of the Russian commanders was lying wounded on the deck, but said that it was unnecessary to call the surgeon as he had already bound up his wound with his handkerchief. He also mentions that the ordinary first aid package is not sufficient, as the injuries from shells are generally multiple. It is best to postpone all operations as much as possible, he says, until the wounded can be transferred to a hospital ship.

65. Results of Operative Treatment of Gastric Cancer.—Creite reviews the experiences at Braun's clinic at Göttingen with 241 cases of cancer of the stomach. An operation was undertaken in all but 30. The stomach was resected in 50 cases and in 2 bilateral metastasis in the ovaries was observed later. Seven of these patients are still in good health; 19 died during or soon after the operation, and 24 died later. In 4 cases death occurred from heart failure soon after the operation; these patients were between 56 and 65 years of age, but four others over 60 bore the operation exceptionally well. Postoperative pneumonia was the cause of death in 4 cases, and 7 patients succumbed to suppurative peritonitis. The sutures held well in all but one of this latter group of cases. About 48 per cent. of the patients died within a year; 33 per cent. within two, and 19 per cent. within three years. One patient is still in good health more than fourteen years after the gastrectomy. This patient, a woman of 49, had noticed pains in the stomach and loss of appetite for six months, and at about the fourth month discovered a lump in the stomach region. There was no vomiting, but much emaciation. The stomach was much dilated and a hard knobby tumor could be palpated in the vicinity of the umbilicus. There was no free lactic acid. The operation revealed a freely movable tumor in the pylorus, which was resected and the stomach sutured to the duodenum after resection of 17 and 5 cm. The patient has since been in perfect health, eats everything, and attends to her household duties.

Münchener medizinische Wochenschrift.

66 (LIV, No. 22, pp. 1065-1112.) *Resemblances Between Sleeping Sickness and Progressive Paralysis. (Schlafkrankheit und prog. Par.) W. Spielmeyer.
67 *Roentgen Research on Stomach. (Verwendung der R-Strahlen zur Diagnose der Magenkrankheiten, etc.) F. M. Groedel III.
68 Interpretation of Percussion Findings in Pleurisy with Effusion. (Perkussion bei exsudativer Pleuritis.) E. Bachmann.
69 Technic of Bacteriologic "Typhoid Bile Tube" Test. (Blutanreicherung vermittels der "Typhusgallerröhre.") H. Kayser.
70 Simplified Fehling Test for Sugar in Urine. (Harnuntersuchungen in der Praxis.) K. Grube.
71 Lead Poisoning from Bullets After Firearm Wounds. (Bleivergiftung durch Geschosse.) E. Braatz.
72 *Phimosis as Cause of Internal Affections in Boys. (Phimose.) Witzenhausen.
73 New Device for Fastening and Compressing in Roentgen Work. (Roentgenographie.) Kaestle (Munich).
74 Instrumentarium for Public Vaccinator. (Instrumentarium für den öffentlichen Impfarzt.) A. Groth (Ib.).
75 Spool Tampon Case. (Tamponbüchse.) O. Scheven.
76 Historical Sketch of Scopolamin. (Bilsenkrautextrakt als Narkoticum.) G. Klein.

66. Resemblance Between Sleeping Sickness and Progressive Paralysis.—Spielmeyer presents evidence to show the close analogy between the pathologic anatomy of sleeping sickness and progressive paralysis. This and other points of resemblance are explained by the comparative research on trypanosome and spirochete affections. Schaudinn was able to discover forms showing transitions between trypanosomes and spirochetes, demonstrating the family connection between them. Pathologic anatomy and clinical experience are confirming these results of purely biologic research, and the reverse is also true, that biologic research is throwing new light on the clinic and on pathology.

67. Roentgen Examination of Shape, Size and Location of Stomach.—Groedel gives a dozen illustrations of the normal and pathologic stomach examined with the Roentgen rays after ingestion of Rieder's bismuth test meal, that is, gruel, spinach, hash or the like, to which a suspension of 40 or 50 gm. of bismuth has been added and the whole mixture diluted with water or milk to a total of 400 gm.

72. Clinical Importance of Phimosis.—Witzenhausen reports four cases to sustain his assertion that phimosis is an important cause of internal affections in boys. Greater attention should be paid to it, as it is liable to induce severe intestinal troubles, especially obstinate constipation and its consequences. The injurious effects of the intestinal trouble may leave an indelible impress on the organism and interfere with normal development even long after the phimosis has been corrected. In one case the child had been under medical care for a long time, but the physician had overlooked or disregarded the phimosis; all disturbances vanished at once after its correction.

Grèce Médicel, Syra, Greece.

77 (IX, Nos. 1-4, pp. 1-8.) *Pathogenesis of Bilious Hemoglobinuric Fever. (Fièvre bilieuse hémoglobinurique.) S. J. Kanellis.
78 *How Quinin Induces Hemoglobinuria. (Hémoglobinurie.) T. Anastasiadès.
79 Influence of Acute Malaria in Inducing Essential Manifestations in Liver, Kidneys, Blood and Capillaries. (Influence du paludisme aigu.) C. Kassiopoulos.
80 *Meningitis due to Malarial Infection. (Méningites par suite de paludisme.) G. C. Pitaoulis.
81 (Nos. 5-7, pp. 9 16.) *Id. Z. G. Lelios.
82 *Treatment of Pneumonia During Malarial Cachexia. (Pneumonie, etc.) S. Theophanidis.
83 *Rachitis. (Rachitisme.) P. N. Divaris.
84 *Cerebrospinal Fluid in the Insane. (Liquide céphalorachidien chez les aliénés.) G. Zilanakis.

77. Pathogenesis of Bilious Hemoglobinuric Fever.—Kanellis gives a historical sketch of the subject and then states his own impressions. He believes that any cause producing destruction of the red corpuscles is followed by a reaction on the part of the organism. If the amount of hemoglobin liberated by the hemolysis is not very large, it is entirely arrested in the liver and transformed into bile pigment. In that case urobilinuria may be observed. In case of a larger amount of free hemoglobin, the liver transforms it into a larger quantity of bile pigments, and some pass into the blood, entailing icterus, and urobilinuria and choluria will then be observed. When the amount of free hemoglobin is excessive, the liver is unable to work it all up into bile pigments, and some of it passes through the organ and is eliminated unmodified in the urine, and hemoglobinuria results. The overworked liver and spleen become congested and enlarged, while the relics of the red corpuscles are eliminated through the kidneys causing albuminuria. These three forms of the reaction of the organism to hemolysis are all observed, he states, in malarial infection, likewise transitional and blended forms.

78. **How Quinin Induces Hemoglobinuria.**—Anastasiadès has become convinced that quinin may act locally on the sensibility of the mucous lining of the stomach. Apparently by vasomotor reflex action it affects some nerve center presiding over the production of hemoglobin, and hemoglobinuria results. He thinks that this might be prevented by giving some drug to soothe the stomach nerves and thus to inhibit reflex action. A sedative given with the quinin may ward off all danger from this source, he states, and prevent hemoglobinuria. The latter is rare when quinin is injected subcutaneously, and even in those rare cases the action of the quinin is due to the same mechanism, as it acts on the gastric mucosa by exosmosis.

80 and 81. **Meningitis of Malarial Origin.**—Lellos and others relate a number of instances of severe meningitis due apparently to malarial infection and promptly cured by quinin. They urge quinin treatment in all cases of meningitis in which malarial infection can be surmised.

82. **Pneumonia During Malarial Cachexia.**—Theophanidis relates a number of instances from his experience to illustrate the necessity for quinin treatment during pneumonia occurring in a person debilitated by malarial infection. The pneumonia should be treated as usual, but quinin should be given regularly, as, without it, the malaria reinforces the pneumonic invasion. When the malarial debility is extreme there is little hope for the patient in intercurrent pneumonia, but with moderate malarial debility, appropriately treated with quinin, he was able to save two-thirds of his patients.

83. **Rachitis.**—Divaris thinks that rachitis can be avoided by breast feeding. He states that the affection is unknown in Japan, because Japanese women nurse their children.

84. **Cerebrospinal Fluid in the Insane.**—Zilamakis examined the fluid in 107 insane patients, making 160 examinations. He found that lymphocytosis in the cerebrospinal fluid is one of the earliest and most constant signs of general paralysis. It was pronounced in all but 3 out of 53 patients with general paralysis. In these exceptions the affection was in an advanced stage in 2 and in an arrested, incipient phase in the other. The lymphocytosis was always most pronounced in the acute and progressive stages and the large mononuclears were also most abundant in these phases of the paralysis, while the polynuclears were comparatively few or absent altogether. The proportion of albumin in the fluid was always found high in general paralysis, seldom below 1 gm. to the liter, and only once above 3 gm. The increase in the proportion of albumin seems to be progressive and to parallel the course of the paralysis, even after the lymphocytosis has commenced to decline as the affection becomes more and more chronic. In one case the fluid was yellow. Progressive doses of opium are liable to increase the number of leucocytes found in the fluid, sometimes inducing actual lymphocytosis. The findings were constantly negative in the cases of dementia, arteriosclerosis and other affections in the insane. Even a slight tendency to lymphocytosis was observed only in the rarest cases, and never in arteriosclerosis. The alcoholic patients displayed the largest proportion of albumin in the cerebrospinal fluid outside of the cases of general paralysis, but it never reached 1 gm. to the liter. His experience indicates that the epileptiform attacks of general paralysis are favorably influenced by lumbar puncture.

Nordiskt Medicinskt Arkiv, Stockholm.

85 (XXXIX, Internal Medicine, No. 4.) *Diet in Kidney Affections. (Diatetik der Nierenkrankheiten.) K. Hanssen.

86 *Smallpox in Antiquity. (La variole laus l'Ancien Testament et dans le papyrus Ebers.) B. Ebbell.

85. **Diet in Kidney Affections.**—Hanssen tabulates the findings in regard to the metabolism of a number of persons on different diets. They show that the amount of solids eliminated in the urine is as large on a strict milk diet as on a meat diet. The demands on the kidneys are thus as high on a milk diet as when meat is ingested. Fats and carbohydrates, on the contrary, made far less demands on the kidneys, the latter less than the fats. He confirms the reliability of the "variability test" to determine the functional capacity of the kidneys (described in THE JOURNAL, Feb. 16, 1907, page 654). His conclusions are that a predominant or exclusive diet of carbohydrates with a little fat is indicated in all cases in which the functional capacity of the kidneys is reduced to or below the limits of normal sufficiency. Milk and meat, providing the same amount of calories, cause elimination through the kidneys of about the same amount of molecules, while materially smaller amounts of solid elements are eliminated through the kidneys on a diet of carbohydrates with a little fat. He regards a maximal specific gravity of 1.014 or 1.015 under the "variability test" of the urine as an indication that the limits of sufficiency of the kidneys have been reached, and that meat and milk should be restricted. If the specific gravity does not rise higher than 1.013 or 1.014, or there are signs of retention, then meat and milk should be entirely or almost entirely suppressed. In case of uremia nothing should be allowed but gruels with milk sugar. This takes the place of milk in regard to diuretic action.

86. **Smallpox in the Old Testament and in the Ebers Papyrus.**—Ebbell practiced a number of years in Madagascar and was astonished to find the nomenclature of diseases so extensive and well defined in the native language. He remarks that this has also been the experience of others among various peoples of the same stage of civilization or lack of it, and he argues that the same probably applies to the peoples of antiquity. They had undoubtedly a correct idea of various diseases, although unable to describe them correctly. The names bestowed on various diseases designated special, well-defined affections. He reviews the pathology of the Old Testament and of the Ebers papyrus, presenting arguments to prove that the sixth plague in Egypt and Job's affliction were both smallpox. All Job's complaints might apply to smallpox, as also all the other references to "*schechin*." The Ebers papyrus, he says, also presents evidence that smallpox was known in Egypt at least 2,000 B. C.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interest of our readers.

DISEASES OF THE INTESTINES AND PERITONEUM. By Prof. Dr. Hermann Nothnagel, Late Professor of Special Pathology and Therapy, University of Vienna. Edited, With Additions, by H. D. Rolleston, M.A., M.D., F.R.C.P., Physician to St. George's Hospital. Second Edition, Thoroughly Revised, Authorized Translation from the German under the Editorial Supervision of Alfred Stengel, M.D., Professor of Clinical Medicine in the University of Pennsylvania. Cloth. Pp. 1059. Price, $5.00 net. Philadelphia: W. B. Saunders Company, 1907.

MORRIS'S HUMAN ANATOMY. A Complete Systematic Treatise by English and American Authors. Edited by Henry Morris, M.A., and M.B., Lond., F.R.C.S. Eng., President of the Royal College of Surgeons, England, and J. Playfair McMurrich, A.M., Ph. D., Professor of Anatomy, University of Michigan. Illustrated. Fourth Edition, Revised and Enlarged. In Five Parts. Cloth. Part IV, Organs of Digestion, Etc.; Price $1.50. Part V, Surgical and Topographical Anatomy; Price, $1.00. Philadelphia: P. Blakiston's Son & Co., 1907.

MANUAL OF DISEASES OF THE EAR, NOSE AND THROAT. By John H. Johnson Kyle, B.S., M.D., Professor of Clinical Otology, Rhinology and Laryngology in the Medical College of Indiana, Department of Medicine of Purdue University. Second Edition, Revised and Enlarged. With 169 Illustrations. Flexible Leather. Pp. 627. Price, $3.00 net. Philadelphia: P. Blakiston's Son & Co., 1907.

SURGERY, ITS PRINCIPLES AND PRACTICE, by Various Authors. Edited by William Williams Keen, M.D., LL.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume II, with 579 Illustrations. Cloth. Pp. 920. Price, $7.00 net. Philadelphia: W. B. Saunders Company, 1907.

MATERIA MEDICA AND PHARMACY. By Reynold Webb Wilcox, M.A., M.D., LL.D., Professor of Medicine at the New York Post-Graduate Medical School and Hospital, etc. Seventh Edition, Revised. Cloth. Pp. 490. Price, $2.50 net. Philadelphia: P. Blakiston's Son & Co., 1907.

MERCK'S 1907 INDEX (Third Edition). An Encyclopedia for the Chemist, Pharmacist and Physician, Stating the Names, Synonyms, etc., of the Chemicals and Drugs Used in Chemistry, Medicine and the Arts. Cloth. Pp. 472. New York: Merck & Co.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION. Volume xix. Nineteenth Session, Held at Baltimore, Maryland, Dec. 11-13, 1906. Edited by W. D. Haggard, M.D. Cloth. Pp. 565. Published by the Association, 1907.

TRANSACTIONS OF THE BERKS COUNTY (Pa.) MEDICAL SOCIETY for the Year Ending December, 1906. Volume xi. Paper. Pp. 51. Reading, Pa.: Norton Printing House, 1907.